Reference Manual
00809-0200-4705, Rev AA
May 2015

Rosemount 705 Wireless Totalizing Transmitter

IEC

WirelessHART

EMERSON
Process Management

Rosemount 705 Wireless Totalizing Transmitter

NOTICE

Read this manual before working with the product. For personal and system safety, and for optimum product performance, make sure to thoroughly understand the contents before installing, using, or maintaining this product.

The United States has two toll-free assistance numbers and one international number.

Customer Central
1 800 999 9307 (7:00 a.m. to 7:00 p.m. CST)

National Response Center
1 800 654 7768 (24 hours a day)
Equipment service needs

International
1 952 906 8888

⚠ CAUTION

The products described in this document are NOT designed for nuclear-qualified applications.

Using non-nuclear qualified products in applications that require nuclear-qualified hardware or products may cause inaccurate readings.

For information on Rosemount nuclear-qualified products, contact an Emerson Process Management Sales Representative.

⚠ WARNING

Explosions could result in death or serious injury.

Installation of this transmitter in an explosive environment must be in accordance with the appropriate local, national, and international standards, codes, and practices. Review the approvals section of the 705 Reference Manual for any restrictions associated with a safe installation.

- Before connecting a Field Communicator in an explosive atmosphere, ensure the instruments are installed in accordance with intrinsically safe or non-incendive field wiring practices.

Electrical shock can result in death or serious injury.

- Avoid contact with the leads and terminals. High voltage that may be present on leads can cause electrical shock.

NOTICE

The 705 Transmitter and all other wireless devices should be installed only after the Smart Wireless Gateway has been installed and is functioning properly. Wireless devices should also be powered up in order of proximity from the Smart Wireless Gateway, beginning with the closest. This will result in a simpler and faster network installation.

NOTICE

Shipping considerations for wireless products:

The unit was shipped to you without the power module installed. Remove the power module prior to shipping.

Each power module contains two “C” size primary lithium batteries. Primary lithium batteries are regulated in transportation by the U. S. Department of Transportation, and are also covered by IATA (International Air Transport Association), ICAO (International Civil Aviation Organization), and ARD (European Ground Transportation of Dangerous Goods). It is the responsibility of the shipper to ensure compliance with these or any other local requirements. Consult current regulations and requirements before shipping.

NOTICE

Power module considerations:

The power module with the wireless unit contains two “C” size primary lithium/thionyl chloride batteries. Each battery contains approximately 2.5 grams of lithium, for a total of 5 grams in each pack. Under normal conditions, the battery materials are self-contained and are not reactive as long as the batteries and the pack integrity are maintained. Care should be taken to prevent thermal, electrical, or mechanical damage. Contacts should be protected to prevent premature discharge.

Battery hazards remain when cells are discharged.

Power modules should be stored in a clean and dry area. For maximum battery life, storage temperature should not exceed 30 °C.

The power module has surface resistivity greater than one gigaohm and must be properly installed in the wireless device enclosure. Care must be taken during transportation to and from the point of installation to prevent electrostatic charge build-up.

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Section 1 Introduction

1.1 Safety messages

Instructions and procedures in this section may require special precautions to ensure the safety of the personnel performing the operations. Information that potentially raises safety issues is indicated by a warning symbol (⚠). Refer to the following safety messages before performing an operation preceded by this symbol.

1.1.1 Warnings

⚠ WARNING

Failure to follow these installation guidelines could result in death or serious injury.

- Only qualified personnel should perform the installation.

Explosions could result in death or serious injury.

- Before connecting a Field Communicator in an explosive atmosphere, make sure that the instruments are installed in accordance with intrinsically safe or non-incendive field wiring practices.
- Verify the operating atmosphere of the transmitter is consistent with the appropriate hazardous locations certifications.

Electrical shock could cause death or serious injury.

- Use extreme caution when making contact with the leads and terminals.

1.2 Transmitter overview

Benefits of the Rosemount 705 Wireless Totalizing Transmitter include:

- An installation-ready solution that provides simple connection to a turbine meter or a pulse output device with a totalizing option
- Wireless output with flow and volume are continuously measured between wireless updates with >99% data reliability delivers rich HART® data, protected by industry leading security
- Simple installation

1.2.1 Functions of the transmitter

Background of turbine meter operations

A turbine meter produces an accurate measurement that is achieved by using a bladed rotor that turns at a speed proportional to rate of flow. The rotation of the rotor is sensed by electrical pickoffs mounted on the meter body, generating a pulsing voltage. The total number of pulses collected over a period of time represents the metered volume.

The Rosemount 705 Wireless Totalizing Transmitter's primary function is to read the number of pulses and then use this information to calculate flow and total volume. This information can then be sent via *Wireless*HART® to the Gateway.

1.2.2 Wireless considerations

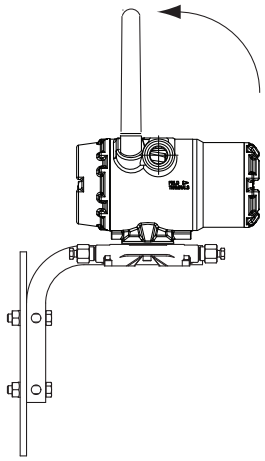
Power up sequence

The Smart Wireless Gateway should be installed and functioning properly before any wireless field devices are powered. Install the Black Power Module, SmartPower™ Solutions model number 701PBKKF into the Rosemount 705 Transmitter to power the device. Wireless devices should also be powered up in order of proximity from the Gateway, beginning with the closest. This will result in a simpler and faster network installation. Enable Active Advertising on the Gateway to ensure that new devices join the network faster. For more information see the Smart Wireless Gateway Manual (document number 00809-0200-4420).

Antenna position

The antenna should be positioned vertically, either straight up or straight down, and it should be approximately 3 ft. (1 m) from any large structure, building, or conductive surface to allow for clear communication to other devices.

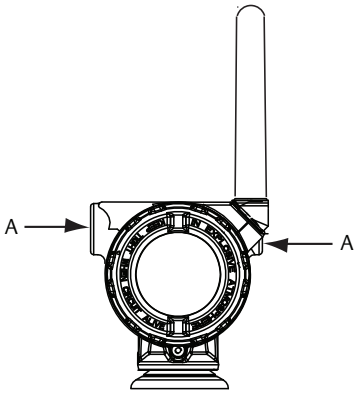
Figure 1-1. Antenna Position



Preparing (or sealing) the conduit entries

Due to possible damage from moisture after installation, ensure that each conduit entry is either sealed with a conduit plug with appropriate thread sealant, or has an installed conduit fitting or cable gland with appropriate thread sealant.

Figure 1-2. Locating Conduit Entries

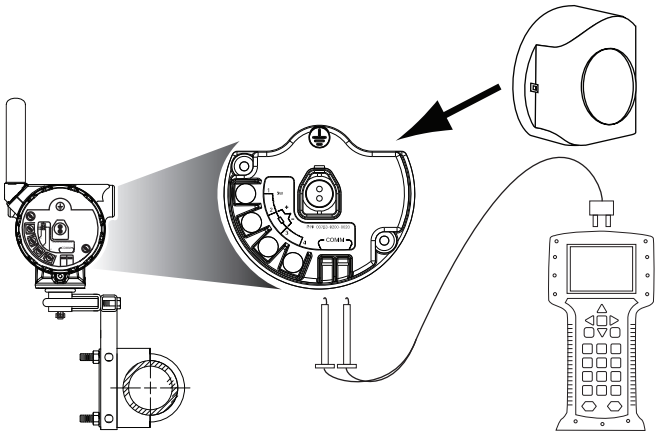


A. Conduit entry

Connecting the Field Communicator to the transmitter

The power module needs to be connected for the Field Communicator to interface with the 705 Transmitter.

Figure 1-3. Field Communicator Connections



1.2.3 Choosing an installation location and position

When choosing an installation location and position, take into account access to the transmitter. For best performance, the antenna should be vertical with space between objects in a parallel metal plane, such as a pipe or metal framework, as the pipes or framework may adversely affect the antenna's performance.

1.2.4 Electrical

Caring for the power module

The Rosemount 705 Wireless Totalizing Transmitter is self-powered. The included Black Power Module contains two “C” size primary lithium/thionyl chloride batteries. Each battery contains approximately 2.5 grams of lithium, for a total of 5 grams in each pack. Under normal conditions, the battery materials are self-contained and are not reactive as long as the batteries and the power module are maintained. Care should be taken to prevent thermal, electrical, or mechanical damage. Contacts should be protected to prevent premature discharge.

Making turbine meter connections

Make turbine meter connections through the cable entry in the side of the connection head. Be sure to provide adequate clearance for cover removal and lead attachments (remote option).

1.2.5 Verifying operating atmosphere

Verify the operating atmosphere of the transmitter is consistent with the appropriate hazardous locations certifications.

Isolating the transmitter from sources of heat

The transmitter will operate within specifications for ambient temperatures between -40 and 185 °F (-40 and 85 °C). Heat from the process is transferred from the switch to the transmitter housing. If the expected process temperature is near or beyond specification limits, consider using an extension, or remote mount the transmitter to thermally isolate it from the process.

Temperature limits

	Operating limit	Storage limit
With LCD Display	-4 to 175 °F -20 to 80 °C	-40 to 185 °F -40 to 85 °C
Without LCD Display	-40 to 185 °F -40 to 85 °C	-40 to 185 °F -40 to 85 °C

1.3 Service support

To expedite the return process outside of North America, contact your Emerson Process Management representative.

Within the United States, call the Emerson Process Management Response Center toll-free number 1 800 654 7768. The center, which is available 24 hours a day, will assist you with any needed information or materials.

The center will ask for product model and serial numbers, and will provide a Return Material Authorization (RMA) number. The center will also ask for the process material to which the product was last exposed.

⚠ CAUTION

Individuals who handle products exposed to a hazardous substance can avoid injury if they are informed of, and understand, the hazard. If the product being returned was exposed to a hazardous substance as defined by OSHA, a copy of the required Material Safety Data Sheet (MSDS) for each hazardous substance identified must be included with the returned goods.

Shipping Wireless Products (Lithium Batteries):
The unit was shipped without the Power Module installed. Remove the Power Module from the unit before shipping.

Primary lithium batteries (charged or discharged) are regulated during transportation by the U.S. Department of Transportation. They are also covered by IATA (International Air Transport Association), ICAO (International Civil Aviation Organization), and ARD (European Ground Transportation of Dangerous Goods). It is the responsibility of the shipper to ensure compliance with these or any other local requirements. Consult current regulations and requirements before shipping.

1.4 Product recycling/disposal

Recycling of equipment and packaging should be taken into consideration. The product and packaging should be disposed of in accordance with local and national legislation.

Section 2 Configuration

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Connections are not polarity sensitive. . . . . page 8
Configuring the transmitter on the bench . . . . . page 8
Joining the device to a network . . . . . page 10

2.1 Safety messages

Instructions and procedures in this section may require special precautions to ensure the safety of the personnel performing the operations. Information that potentially raises safety issues is indicated by a warning symbol (⚠). Refer to the following safety messages before performing an operation preceded by this symbol.

2.1.1 Warnings

⚠ WARNING

Failure to follow these installation guidelines could result in death or serious injury.

- Only qualified personnel should perform the installation.

Explosions could result in death or serious injury.

- Before connecting a Field Communicator in an explosive atmosphere, make sure that the instruments are installed in accordance with intrinsically safe or non-incendive field wiring practices.
- Verify the operating atmosphere of the transmitter is consistent with the appropriate hazardous locations certifications.

Electrical shock could cause death or serious injury.

- Use extreme caution when making contact with the leads and terminals.

2.1.2 Connecting the turbine meter or pulse output device

The Rosemount 705 Wireless Totalizing Transmitter is compatible with a number of simple turbine meters or pulse output devices. When ordered in the optional configuration for direct connection, option code D1, the Rosemount 705 Transmitter is compatible with one inch turbine meter direct connections. Figure 2-1 on page 8 shows the correct input connections to the pulse terminals on the transmitter. To ensure a proper turbine meter connection, anchor the turbine meter lead wires into the appropriate compression terminals and tighten the screws. In noisy environments, be sure to properly ground the transmitter using the ground terminal.

Wiring the transmitter

⚠ For the R1 option (remote mount), if the turbine meter or pulse output device is installed in a high-voltage environment and a fault condition or installation error occurs, the sensor leads and transmitter terminals could carry lethal voltage. Use extreme caution when making contact with the leads and terminals.

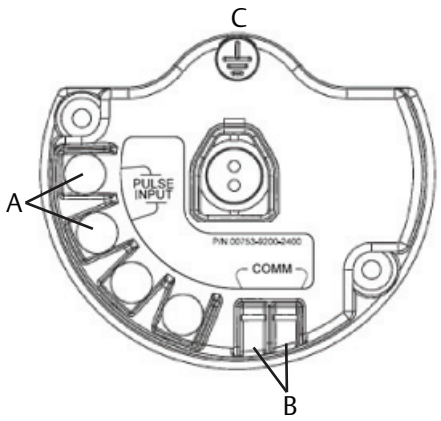
Use the following steps to wire the sensor and power supply to the transmitter:

1. Remove the transmitter enclosure cover.
2. Attach the turbine meter leads according to the diagram Figure 2-1 on page 8.

Note
For noisy electrical environments, it is best practice to ground the loop accordingly.

3. Connect the Black Power Module.
4. Verify the connection and power by viewing the LCD display and seeing the power up sequence.
5. Replace the cover and tighten.

Figure 2-1. 705 Terminal Block



A. Pulse input connection
B. HART® terminal connection
C. Terminal block ground connection

Note
Connections are not polarity sensitive.

2.2 Configuring the transmitter on the bench

When using a Field Communicator, any configuration changes must be sent to the transmitter using the **Send** key (**F2**). AMS Wireless Configurator configuration changes are implemented when the **Apply** button is clicked.

Configuring on the bench with AMS Wireless Configurator

AMS Wireless Configurator is capable of connecting to devices directly, using a HART modem, or with the Gateway. When configuring on the bench with a HART modem, double click the device icon, then choose the **Configure/Setup** tab (or right click and select **Configure/Setup**). Configure the device settings using the Direct Connection menu. When configuring with the Gateway, double click the device icon then choose the **Configure/Setup** tab (or right click and select **Configure/Setup**). Configure the device settings using the Wireless Connection menu. To check or change sensor configuration using a Field Communicator, enter the following Fast Key Sequence: **2, 1, 2**.

2.3 Supported Engineering Unit Codes

The following engineering units are supported by the 705 totalizer.

Total Volume	Volumetric Flowrate
US Gallons	US Gallons per Second
	US Gallons per Minute
	US Gallons per Hour
	US Gallons per Day
Liters	Liters per Second
	Liters per Minute
	Liters per Hour
Imperial Gallons	Imperial Gallons per Second
	Imperial Gallons per Minute
	Imperial Gallons per Hour
	Imperial Gallons per Day
Cubic Meters	Cubic Meters per Second
	Cubic Meters per Minute
	Cubic Meters per Hour
	Cubic Meters per Day
Cubic Yards	Cubic Yards per Second
	Cubic Yards per Minute
	Cubic Yards per Hour
	Cubic Yards per Day
Cubic Inches	Cubic Inches per Second
	Cubic Inches per Minute
	Cubic Inches per Hour
	Cubic Inches per Day
Pulses	Hertz

If a custom volume unit is desired, the 705 totalizer can be configured to report the totalized Pulses, and a custom conversion can be done on the host system side. Similarly, if a custom flow rate unit is desired, the 705 totalizer can be configured to report pulses per second (“Hertz”), and a custom conversion can be done on the host system side. When reporting Pulses or Hertz, the configured K-factor has no affect on the reported values.

Configure units fast keys	
Volume units fast keys	2, 1, 2
Flow units fast keys	2, 2, 1

2.4 Joining the device to a network

To communicate with the Gateway, and ultimately the Host System, the transmitter must be configured to communicate with the wireless network.

Using a Field Communicator or AMS Wireless Configurator, enter the Network ID and Join Key so they match the Network ID and Join Key of the Gateway and the other devices in the network. If the Network ID and Join Key are not identical, the transmitter will not communicate with the network. The Network ID and Join Key may be obtained from the Gateway on the *Network>Settings* page on the web server or by clicking network information in the upper right hand corner. Using a Field Communicator, the Network ID and Join Key can be configured using a Field Communicator with the Fast Key Sequence: **2, 1, 3**.

The final device network configuration piece is the Update Rate which, by default, is 1 minute. It can be changed at commissioning, or at any time, by using AMS Wireless Configurator or the Gateway’s web server. The Update Rate should be between 1 second and 60 minutes. To change the Update Rate with a Field Communicator, use the Fast Key Sequence: **2, 1, 4**.

If doing a bench top initial configuration, after completion remove the power module until installation. When the device is installed, insert the power module and close the housing cover securely. Always ensure a proper seal so that metal touches metal, but do not over tighten.

Section 3 Mounting

Safety messages . . . . . page 11
Installing the transmitter . . . . . page 12
LCD display . . . . . page 16
Grounding the transmitter . . . . . page 17

3.1 Safety messages

Instructions and procedures in this section may require special precautions to ensure the safety of the personnel performing the operations. Information that potentially raises safety issues is indicated by a warning symbol (⚠). Refer to the following safety messages before performing an operation preceded by this symbol.

3.1.1 Warnings

⚠ WARNING

Failure to follow these installation guidelines could result in death or serious injury.

- Only qualified personnel should perform the installation.

Explosions could result in death or serious injury.

- Before connecting a Field Communicator in an explosive atmosphere, make sure that the instruments are installed in accordance with intrinsically safe or non-incendive field wiring practices.
- Verify the operating atmosphere of the transmitter is consistent with the appropriate hazardous locations certifications.

Electrical shock could cause death or serious injury.

- Use extreme caution when making contact with the leads and terminals.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions: This device may not cause harmful interference. This device must accept any interference received, including interference that may cause undesired operation.

This device must be installed to ensure a minimum antenna separation distance of 20 cm from all persons.

3.2 Installing the transmitter

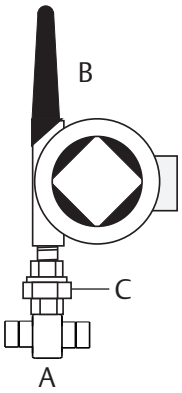
The Rosemount 705 Wireless Totalizing Transmitter can be installed in one of two configurations:

Direct Mount (D1): The turbine meter is connected directly to the 705 Transmitter housing's conduit entry. For installation instructions, see "Installing the transmitter in a direct mount configuration" on page 12.

Remote Mount (R1): The turbine meter or pulse output device is mounted separate from the 705 Transmitter housing, then connected to the Rosemount 705 Transmitter via conduit. For installation instructions, see "Installing the transmitter in a remote mount configuration" on page 14.

3.2.1 Installing the transmitter in a direct mount configuration

Figure 3-1. Direct Mount



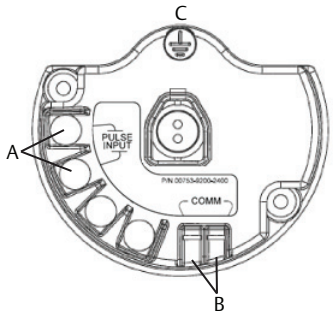
A. Turbine meter
B. 705 Transmitter
C. 1-in. NPT connection to flow meter and 2 piece pipe union

Note
Direct mount installation should not be employed when using tubing and connectors such as Swagelok® fittings.

1. Install the turbine meter according to standard installation practices making sure to use thread sealant on all of the connections.

2. Attach the turbine meter wiring to the terminals as indicated on the wiring diagram (Figure 3-2). This procedure is already included for the D1 (direct mount) option.

Figure 3-2. 705 Terminal Block



A. Pulse input connection
B. HART terminal connection
C. Terminal block ground connection

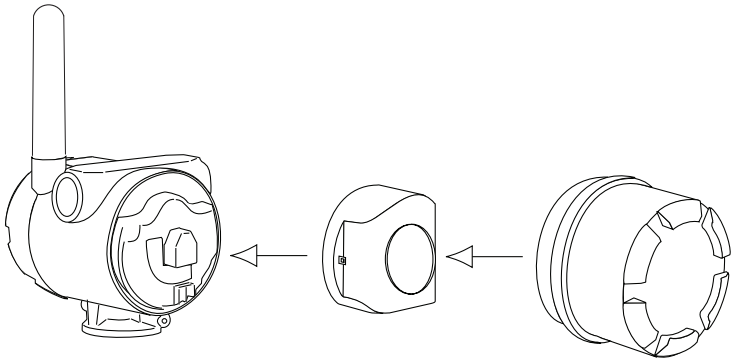
3. Attach the transmitter housing to the turbine meter using the threaded conduit entry.
4. Seal threads on 1-in. NPT turbine meter connection. Take union apart and turn on bottom fitting to turbine meter.
5. Attach mill spec connector to turbine meter pickup.
6. Screw on the remaining union part.

Note
Sealant should already be applied to threads on the D1 (direct mount) option.

Note
Wireless devices should only be powered up after the Smart Wireless Gateway, in order of proximity from the Smart Wireless Gateway beginning with the closest device. This results in a simpler and faster network installation.

7. Connect the Black Power Module

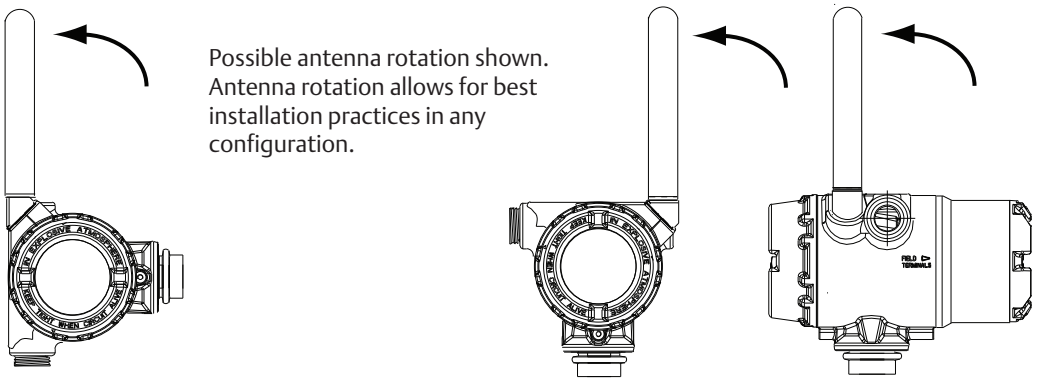
Figure 3-3. Power Module Installation



8. Close the housing cover and tighten to safety specification. Always ensure a proper seal so that metal touches metal, but do not over tighten.
9. Position the antenna so it is vertical, either straight up or straight down.

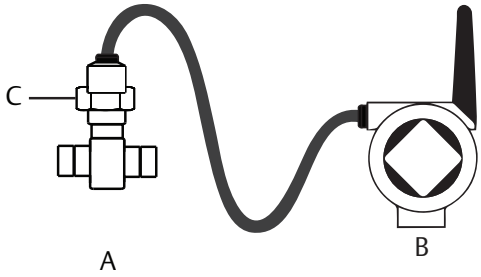
a. The antenna should be approximately 3-ft. (0.91 m) from any large structures or buildings, to allow clear communication to other devices.

Figure 3-4. Antenna Positioning



3.2.2 Installing the transmitter in a remote mount configuration

Figure 3-5. Remote Mount Installation



A. Turbine meter
B. Rosemount 705 Transmitter
C. 1-in. supplied cable gland adaptor for turbine meter.

Included:
(1) Cable gland
(1) Cable gland adaptor for turbine meter
10 ft. of cable connection wiring

1. Install the turbine meter or pulse output device according to standard installation practices being sure to use thread sealant on all of the connections.

2. Pull the cable connection wiring through the supplied cable gland adaptor for the turbine meter. Then pull the cable wiring through the transmitter cable gland.

Note
Pay attention to the orientation of the cable gland to ensure proper connection to transmitter.

3. Attach the turbine meter or pulse output device wiring to the terminals as shown in the wiring diagrams beginning on page 8.

Note
Wireless devices should only be powered up after the Smart Wireless Gateway, in order of proximity from the Gateway beginning with the closest device. This results in a simpler and faster network installation

4. If commissioning the 705 Transmitter, connect the power module as shown in Figure 3-3 on page 13.
5. Close the housing cover and tighten to safety specifications. Always ensure a proper seal by installing the electronic housing covers so that metal touches metal, but do not over tighten.
6. Position the antenna vertically, either straight up or straight down, as shown in Figure 3-4 on page 14.
   a. The antenna should be approximately 3 ft. (1 m) from any large structures or buildings, to allow clear communication to other devices.

3.3 Remote antenna (optional)

The remote antenna option provides flexibility for mounting the Rosemount 705 Totalizer based on wireless connectivity, lightning protection, and current work practices.

⚠ WARNING

When installing remote mount antennas for the transmitter, always use established safety procedures to avoid falling or contact with high-power electrical lines.

Install remote antenna components for the transmitter in compliance with local and national electrical codes and use best practices for lightning protection.

Before installing, consult with the local area electrical inspector, electrical officer, and work area supervisor.

The transmitter remote antenna option is specifically engineered to provide installation flexibility while optimizing wireless performance and local spectrum approvals. To maintain wireless performance and avoid non-compliance with spectrum regulations, do not change the length of cable or the antenna type.

If the supplied remote mount antenna kit is not installed per these instructions, Emerson Process Management is not responsible for wireless performance or non-compliance with spectrum regulations.

The remote mount antenna kit includes coaxial sealant that is for the cable connections, lightning arrestor, and antenna.Find a location where the remote antenna has optimal wireless performance. Ideally this will be 15-25 ft. (4.6 - 7.6 m) above the ground or 6 ft. (2 m) above obstructions or major infrastructure. To install the remote antenna, use one of the following procedures. The WN option is 25 ft. (7.6 m).

3.3.1 WN remote antenna option

1. Mount the antenna on a 1.5-2 in. pipe mast using the supplied mounting equipment.
2. Connect the lightning arrestor directly to the top of the Rosemount 705 Totalizer.
3. Install the grounding lug, lock washer, and nut on top of lightning arrestor.
4. Connect the antenna to the lightning arrestor using the supplied LMR-400 coaxial cable ensuring the drip loop is not closer than 1 ft. (0.3 m) from the lightning arrestor.
5. Use the coaxial sealant to seal each connection between the wireless field device, lightning arrestor, cable, and antenna.
6. Ensure the mounting mast and lightning arrestor are grounded according to local/national electrical code.

Note
Any spare lengths of coaxial cable should be placed in 12 in. (0.3 m) coils.

3.4 LCD display

If an LCD display is ordered, it will be shipped attached to the transmitter.

The optional LCD display can be rotated in 90-degree increments by squeezing the two tabs, pulling out, rotating and snapping back into place.

If the LCD pins are inadvertently removed from the interface board, carefully re-insert the pins before snapping the LCD display back into place.

Installing the LCD display

To install the LCD display, use Figure 3-6 on page 17 and the following instructions:

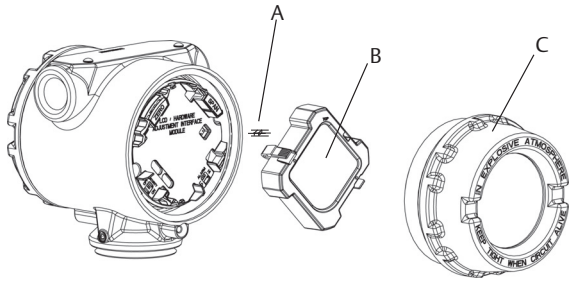
1. Remove the LCD cover. Do not remove the instrument cover in explosive environments when the circuit is live.
2. Put the four-pin connector into the LCD display, rotate to the desired position and snap into place.

   Note the following LCD display temperature limits:

   - Operating: -4 to 175 °F (-20 to 80 °C)
   - Storage: -40 to 185 °F (-40 to 85 °C)
3. Replace the transmitter cover.

Note
Only use Rosemount Wireless LCD display part number: 00753-9004-0002. The transmitted data may not match data displayed on LCD due to differences in update rate and screen refresh rate.

Figure 3-6. Optional LCD Display



A. LCD pins
B. LCD display
C. LCD cover

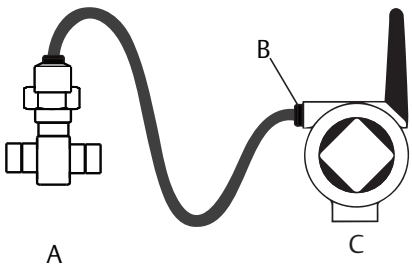
3.5 Grounding the transmitter

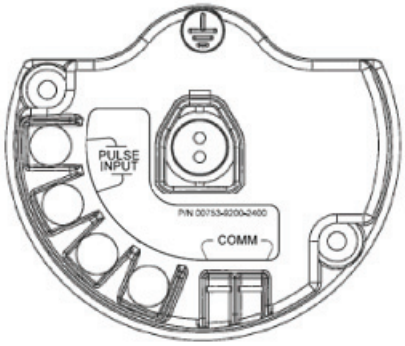
The Rosemount 705 Transmitter operates best with the housing grounded. Floating systems, however, can cause extra noise that may affect the accuracy of the Rosemount 705 Totalizer. If the signal appears noisy or erratic, grounding at a single point may solve the problem. Grounding of the electronics enclosure should be done in accordance with local and national installation codes. Grounding is accomplished through the process connection using the internal or external case grounding terminal.

Determining grounding requirements

Each process installation has different grounding requirements. Use the options recommended by the facility for the specific turbine meter or pulse output device.

1. Connect turbine meter wiring shield to the grounded transmitter housing.
2. Ensure the transmitter housing is electrically isolated from the turbine meter or pulse output device wiring.





A. Turbine meter
B. Rosemount 705 Transmitter
C. Transmitter ground point

Section 4 Commissioning

Safety messages . . . . . page 19
Configuring the transmitter to communicate with the wireless network . . . . . page 20
Using AMS Wireless Configurator to configure the transmitter . . . . . page 21
Using a Field Communicator to change parameters within the device . . . . . page 21
Verifying operation . . . . . page 23

4.1 Safety messages

Instructions and procedures in this section may require special precautions to ensure the safety of the personnel performing the operations. Information that potentially raises safety issues is indicated by a warning symbol (⚠). Refer to the following safety messages before performing an operation preceded by this symbol.

4.1.1 Warnings

⚠ WARNING

Failure to follow these installation guidelines could result in death or serious injury.

- Make sure only qualified personnel perform the installation.

Explosions could result in death or serious injury.

- Before connecting a Field Communicator in an explosive atmosphere, make sure the instruments are installed in accordance with intrinsically safe or non-incendive field wiring practices.
- Verify the operating atmosphere of the transmitter is consistent with the appropriate hazardous locations certifications.

Electrical shock could cause death or serious injury.

- Use extreme caution when making contact with the leads and terminals.

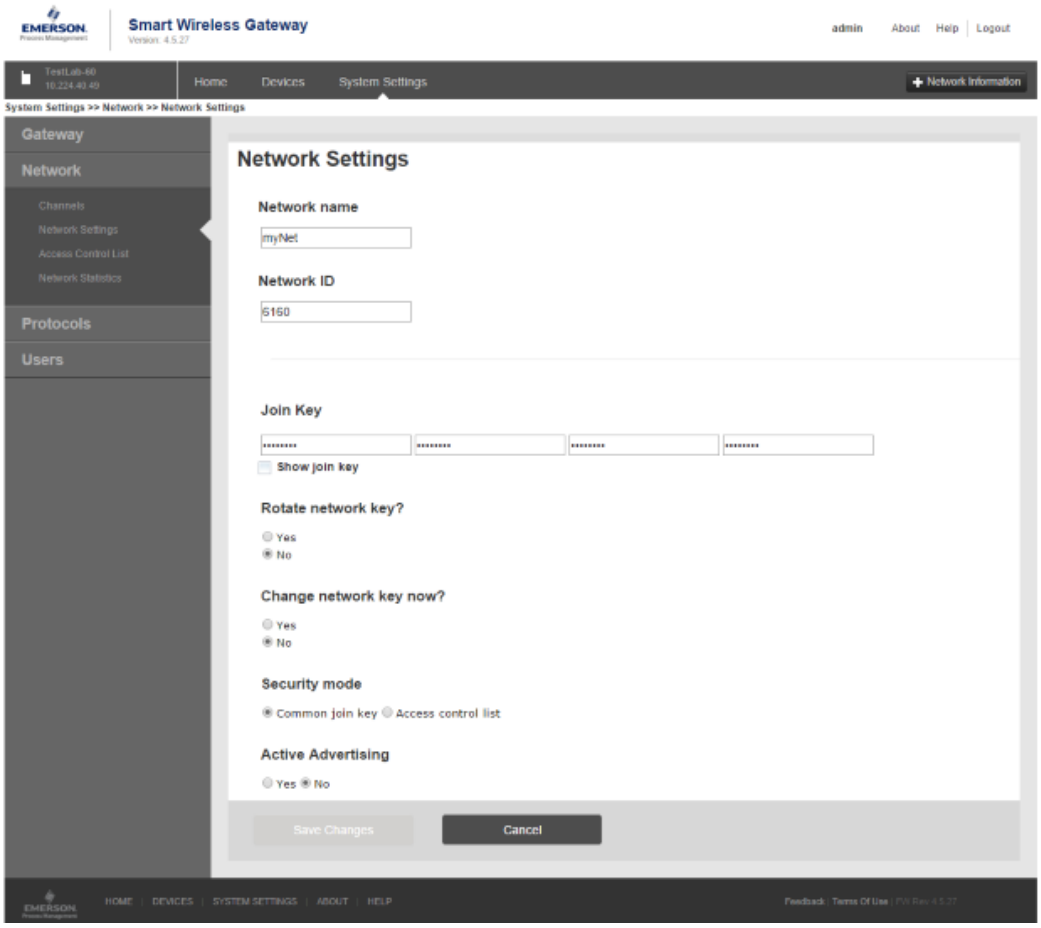
Note
The Rosemount 705 Wireless Totalizing Transmitter and all other wireless devices should be installed only after the Gateway has been installed and is functioning properly.

Wireless devices should be powered up in order of proximity from the Gateway, beginning with the device closest to the Gateway. This will result in a simpler and faster network installation.

4.2 Configuring the transmitter to communicate with the wireless network

In order to communicate with the Smart Wireless Gateway, and ultimately the Host System, the transmitter must be configured to communicate with the wireless network. This step is the wireless equivalent of connecting wires from a transmitter to the Host System. Using a Field Communicator or AMS® Wireless Configurator, enter the Network ID and Join Key so that they match the Network ID and Join Key of the gateway and other devices in the network. If the Network ID and Join Key are not identical, the 705 Transmitter will not communicate with the network. The Network ID and Join Key may be obtained from the Smart Wireless Gateway on the *Setup>Network>Settings* page on the web server, shown in Figure 4-1.

Figure 4-1. Gateway Network Settings



4.3 Using AMS Wireless Configurator to configure the transmitter

1. Right click on the Rosemount 705 Transmitter and select **Configure**.
2. When the menu opens, select **Join Device to Network** and follow the method to enter the Network ID and Join Key.

4.4 Using a Field Communicator to change parameters within the device

The most common parameters changed are the Network ID and Join Key. The Network ID and Join Key may be changed in the wireless device by using the following Fast Key sequence. Set both Network ID and Join Key.

Function	Key sequence	Menu items
Wireless Setup	2, 1, 1	Network ID, Set Join Key

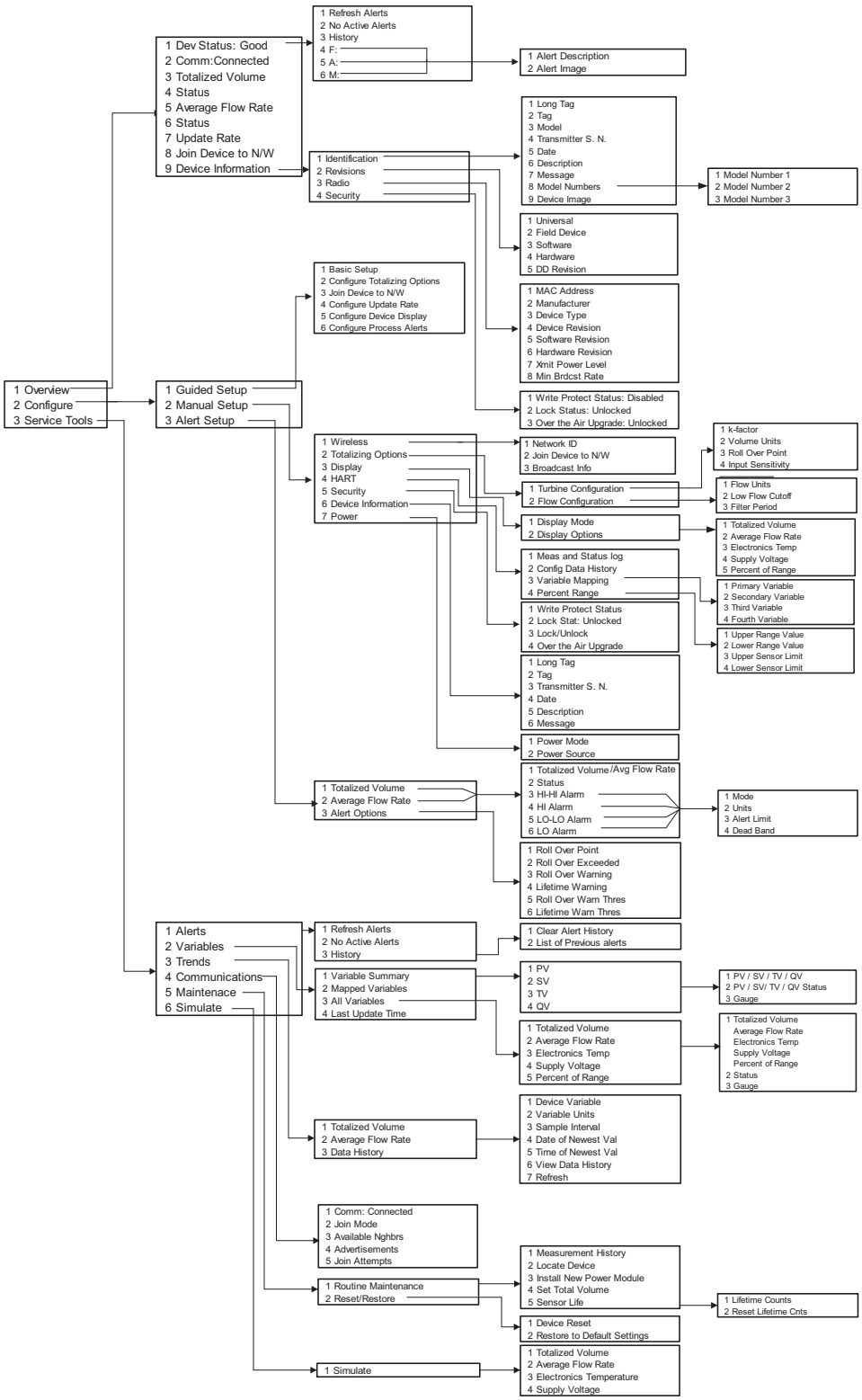
4.5 K-Factor consideration

The K-factor value is used to tell the 705 Totalizer how much volume corresponds to an input pulse. The K-factor is entered in units of “Pulses per Gallon”. It is important to configure the 705 Totalizer with the proper K-factor that corresponds to the turbine meter that it is attached to. If the K-factor is not configured properly, the accuracy of the reported totalized volume and flow rate may be adversely affected. Any time the attached turbine meter is replaced, the K-factor setting should be verified and/or modified accordingly to maintain a proper match.

If the K-factor is not specified to be pre-configured when ordering the 705 Totalizer, it will be shipped without any K-factor configured. In this case, the K-factor must be configured before any valid values can be obtained for the totalized volume or the average flow rate. The 705 Totalizer will report a value of NaN (”Not a Number”) when the K-factor has not been configured.

When changing the K-factor, the 705 Totalizer will recalculate a new totalized volume assuming that all captured input pulses correspond to the new K-factor value. This means that the current value of the totalized volume held in the 705 Totalizer may change as a result of changing the K-factor. If this is not desired, the value of totalized volume can be noted, and reset the volume to the original value after the new K-factor has been configured. To avoid any loss of volume accumulation, this procedure should only be done when the flow through the attached turbine meter has been stopped.

Figure 4-2. Handheld Tree



4.6 Verifying operation

There are four ways to verify operation: using the optional local display (LCD), using the Field Communicator, using the Smart Wireless Gateway's integrated web interface, or by using AMS Suite Wireless Configurator. If the Rosemount 705 transmitter was configured with the Network ID and Join Key, and sufficient time has passed, the transmitter will be connected to the network.

Troubleshooting

If the device is not joined to the network after power up, verify the correct configuration of the Network ID and Join Key, and verify that Active Advertising has been enabled on the Gateway. The Network ID and Join Key in the device must match the Network ID and Join Key of the Gateway.

Operating the local display

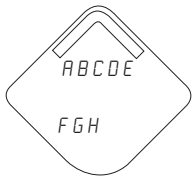
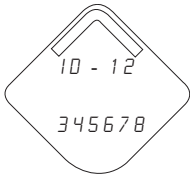
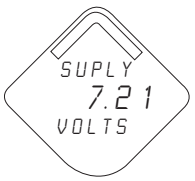
The LCD displays the configured values at the update rate, or can optionally be enabled for continuous display. See Section 5.1.2.

Diagnostic button display sequence

More detailed diagnostic information can be obtained by removing the display cover of the Rosemount 705 Transmitter, and momentarily depressing the **DIAG** button. The LCD will display the diagnostic screens as shown in Figure 4-4.

Press the **Diagnostic** button to display the TAG, Device ID, Software Revision, Network ID, Network Join Status and Device Status screens.

Figure 4-3. Diagnostic Screen Sequence

Tag	Device ID	Network ID	Network join status	Device status
				

Network join status

The chevron-shaped status bar at the top of the screen indicates the progress of the network join process. When the status bar is filled, the device is successfully connected to the wireless network. This is shown, in Figure 4-4 on page 24.

Figure 4-4. Network Join Status Screens

Searching for network	Joining network	Connected with limited bandwidth	Connected

Connecting with a Field Communicator

A 705 DD is required for HART® communication.

Function	Key sequence	Menu items
Communications	2, 1, 3	Join Status, Communication Status, Join Mode, Number of Available Neighbors, Number of Advertisements Heard, Number of Join Attempts

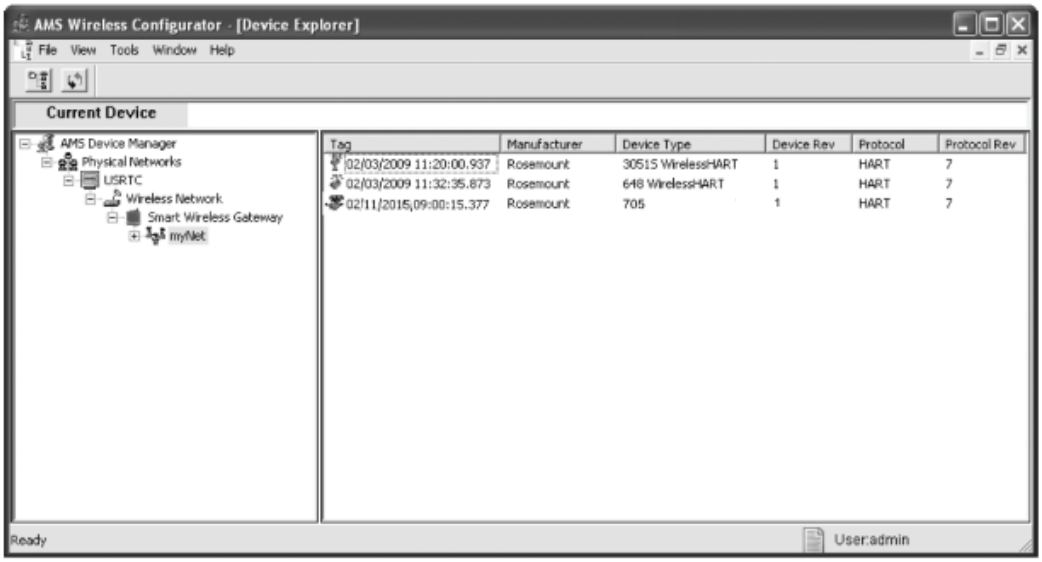
Checking for communication using the Smart Wireless Gateway

In the integrated web interface from the Gateway, navigate to the devices page. This page shows whether the device has joined the network and if it is communicating properly.

Note
The time to join the new device(s) to the network is dependent upon the number of devices being joined and the number of devices in the current network. For one device joining an existing network with multiple devices, it may take up to five minutes. It may take up to 60 minutes for multiple new devices to join the existing network.

4.6.1 AMS Wireless Configurator

When the device has joined the network, it will appear in the Device Manager as illustrated below.



Troubleshooting

If the device is not joined to the network after power up, verify the correct configuration of the Network ID and Join Key, and verify that Active Advertising has been enabled on the Gateway. The Network ID and Join Key in the device must match the Network ID and Join Key of the Gateway.

The Network ID and Join Key may be obtained from the Gateway in the upper right hand corner labeled network information. The Network ID and Join Key may be changed in the wireless device by using the following Fast Key sequence.

Function	Key sequence	Menu items
Wireless	2,1,3	Join Device to Network

Section 5 Operation and Maintenance

Basic operation ..... page 27
Determining device health ..... page 28
Interpreting LCD screen messages ..... page 29
Replacing the power module ..... page 36
Modbus®, EtherNet/IP and OPC mapping ..... page 37

5.1 Basic operation

5.1.1 Rollover information

The totalized volume will automatically restart at a volume of zero when the configured rollover point has been reached. The table below describes some estimates to how long a rollover will take at max values of 10,000,000.00. Best practices are to reset the total before the device rollover occurs. The totalized volume will accumulate in the transmitter up to a configurable rollover point.Once the totalized volume reaches the rollover point, the totalized value will automatically continue totalizing the volume starting from zero. The rollover point defaults to 100 Million, but can be configured to any value between 1 and 2 Billion. Note that the resolution of the totalized volume is reduced as the value gets larger. refer to the table below or see the menu tree

Configured units code	Earliest rollover	Typical longest LCD wait	Typical longest value wait
Cu.M	75 Years	137 Days	39 Minutes
L	27 Days	3 Hours	2 Seconds
UK Gal	125 Days	15 Hours	10 Seconds
US Gal	104 Days	12 Hours	9 Seconds
Barrel	11 Years	21 Days	6 Minutes
Cu.F	2 Years	3 Days	1 Minute
Cu.Y	57 Years	105 Days	30 Minutes
Cu.I	0 Days	3 Minutes	0 Seconds
Pulses	1 Day	50 Seconds	0 Seconds

Note
The rollover value itself is not affected by the volume engineering units. For example, if the rollover value is configured to 100 Million with engineering units of gallons, a change to volume units of cubic meters will cause the rollover value to still be 100 Million, but will rollover at 100 Million Cubic meters rather than 100 Million gallons.

5.1.2 Enabling the LCD continuous operation feature

The Rosemount 705 Wireless Totalizing Transmitter has the ability to keep the LCD always on for local indication of the total volume and average flow for the attached output device. Power module life will be reduced when operating in this mode. For example, at a 1-minute update rates the power module life would be reduced from a 10 year life to an estimated 8 year life. More information on the power module life impact for various update rates can be found at http://www3.emersonprocess.com/rosemount/PowerModuleLifeCalculator/Default.aspx

Enabling continuous LCD updates

AMS® Wireless Configurator or Device Manager

1. Connect the Rosemount 705 to the HART® communicator and access the Rosemount 705 DD.
2. Double click on the **Rosemount 705** icon and select *Configure>Guided Setup> Configure Device Display*

Through the handheld

1. Connect the Rosemount 705 to the HART Handheld device.
2. Fast keys **2, 1, 5**
   a. *Configure>Manual Setup> Display> Display Mode*

5.2 Determining device health

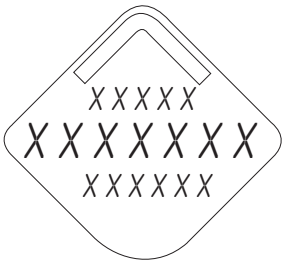
In addition, system considerations must be observed to ensure that the device is still connected to the wireless network and reporting values. On an Emerson Smart Wireless Gateway, this can be done by referring to the parameter: PV_HEALTHY. The PV_HEALTHY has a “True” state when the device is on the network and its updates are current, not late or stale, and the PV value is functioning properly. A “False” state of PV_HEALTHY means that the device is either off of the network, the data updates are not current, or that there is an issue measuring PV. In the case of a “False” state of PV_HEALTHY, it is recommended to assume that the device is not connected to the network and to take appropriate action.

5.3 Interpreting LCD screen messages

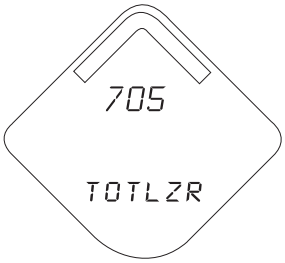
The transmitted data may not match data displayed on LCD display due to differences in update rate and screen refresh rate.

5.3.1 Startup screen sequence

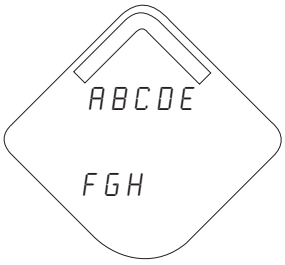
The following screens will display when the power module is first connected to the 705 Transmitter.



1. **All Segments On**: used to visually determine if there are any bad segments on the LCD display

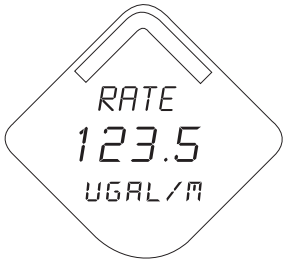


2. **Device Identification**: used to determine Device Type



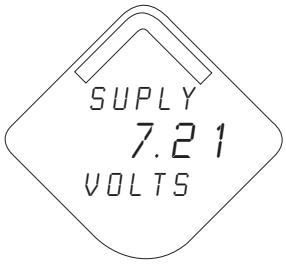
3. **Device Information - Tag**: user entered tag which is 8 characters long - will not display if all characters are blank

4. **Totalized Volume Screen**: accumulated total volume over time

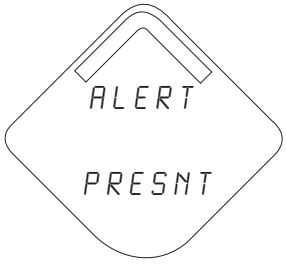


5. **Average Rate Screen**: average rate value

6. **Electronics Screen**: feature board temperature value, can be modified to a specific variable in the DD



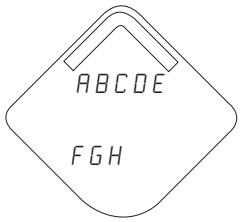
7. **Supply Voltage Screen**: voltage reading at the power module terminals, can be modified to a specific variable in the DD



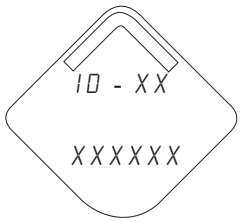
8. **Alert Screen**: at least one alert is present - this screen will not display if no alerts are present

5.3.2 Diagnostic button screen sequence

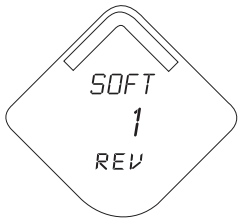
The following five screens will display when the device is operating properly and the Diagnostic Button has been pressed.



1. **Device Information - Tag**: user entered tag which is 8 characters long - will not display if all characters are blank



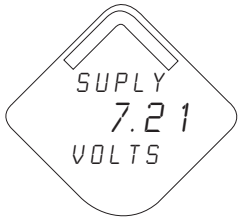
2. **Device Identification**: used to determine Device ID



3. **Software Revision**: indication of the software revision of the device

4. **Network ID**: assuming the device has the correct join key, this ID tells the user what network the device can connect with

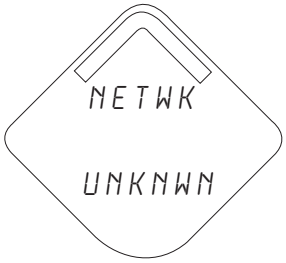
5. **Network Connection Status**: the device has joined a network and has been fully configured and has multiple parents



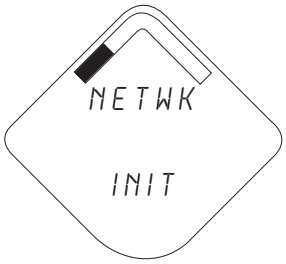
6. **Supply Voltag**e: voltage reading at the power module terminals

5.3.3 Network connection status screens

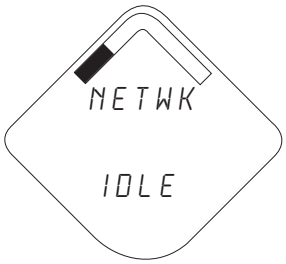
These screens display the network status of the device. Only one will be shown in the fourth position of the diagnostic button screen sequence.



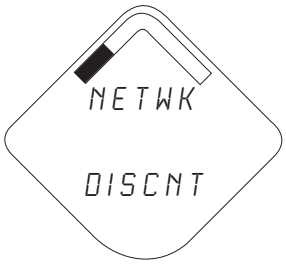
Diagnostic Button Screen 4.1: the device is attempting to start the radio



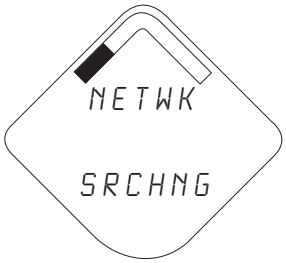
Diagnostic Button Screen 4.2: the device has just restarted



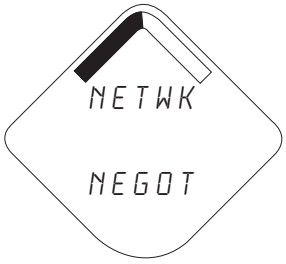
Diagnostic Button Screen 4.3: the device is starting to join the process



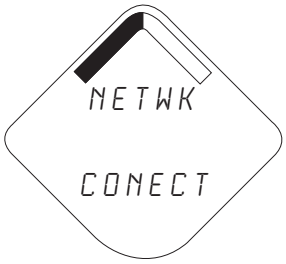
Diagnostic Button Screen 4.4: the device is in a disconnected state and requires a “Force Join” command to join the network



Diagnostic Button Screen 4.5: the device is searching for the Network



Diagnostic Button Screen 4.6: the device is attempting to join a network



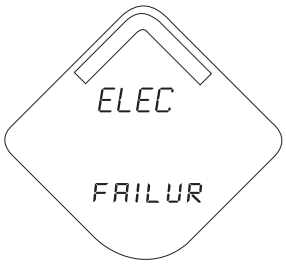
Diagnostic Button Screen 4.7: the device is connected to the Network, but is in a "Quarantined" state

Diagnostic Button Screen 4.8: the device is joined and operational, but is running with limited bandwidth for sending periodic data

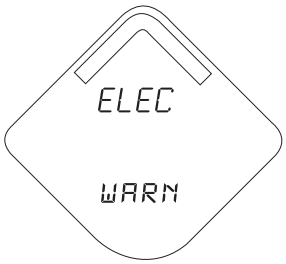
Diagnostic Button Screen 4.9: the device has joined a network and has been fully configured and has multiple parents

5.3.4 Device diagnostic screens

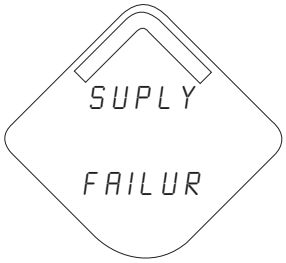
The following screens will show the device diagnostics depending on the state of the device, continuing after Diagnostic Button Screen 5.



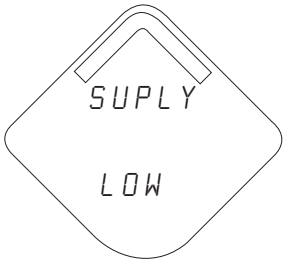
Diagnostic Button Screen 6.1: there is a critical error which may prevent the electronics board from operating correctly



Diagnostic Button Screen 6.2: there is a warning which should be addressed, but should not affect the device output



Diagnostic Button Screen 7.1: terminal voltage has dropped below level of operating limit. Replace the Black Power Module model number 701PBKKF
(Part Number: 00753-9220-0001)

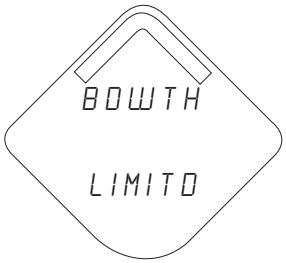


Diagnostic Button Screen 7.2: terminal voltage is below the recommended operating range - if this is a self-operated device, the power module should be replaced - for line powered devices, the supply voltage should be increased

Diagnostic Button Screen 8: device cannot retrieve information from the radio in the device - the device may still be operational and publishing HART data

Diagnostic Button Screen 9: configuration of the transmitter is invalid such that critical operation of the device may be affected - check the extended configuration status to identify which configuration item(s) need to be corrected

Diagnostic Button Screen 10: switch attached to the transmitter has failed, and valid readings from that switch are no longer possible - check the switch and switch wiring connections - check additional status for more detailed information of the failure source



Diagnostic Button Screen 11: device has not yet received all of the requested wireless bandwidth needed to operate as configured

Note
Use Rosemount Wireless LCD display part number: 00753-9004-0002.

5.4 Replacing the power module

When the power module needs to be replaced, remove the power module cover and the depleted power module. Replace the power module with a new Black Power Module, SmartPower™ Solutions model number 701PBKKF (part number 00753-9220-0001). Then replace the cover and tighten it to specification. Always ensure a proper seal so metal touches metal, but do not over-tighten. After the power module has been replaced, navigate to AMS Wireless Configurator to reset the power module function. This also can be done via the handheld **3, 5, 1, 3**.

⚠ WARNING

When replacing the power module, the device will stop totalizing data. The device will resume from where the last total was periodically recorded (within a 5 minute window). Example: The best practice when replacing the power module is to make note of the totalized volume before removing the power module. After installing a new power module, the totalized volume can be set to the previous recorded value.

Handling the power module

The Black Power Module with the wireless unit contains two “C” size primary lithium/thionyl chloride batteries. Each battery contains approximately 2.5 grams of lithium, for a total of 5 grams in each pack. Under normal conditions, the battery materials are self-contained and are not reactive as long as the batteries and the battery pack integrity are maintained. Care should be taken to prevent thermal, electrical or mechanical damage. Contacts should be protected to prevent premature discharge.

Use caution when handling the power module, it may be damaged if dropped from heights in excess of 20 feet.

⚠ Battery hazards remain when cells are discharged.

Environmental considerations

As with any battery, local environmental rules and regulations should be consulted for proper management of spent batteries. If no specific requirements exist, recycling through a qualified recycler is encouraged. Consult the materials safety data sheet for battery specific information.

Shipping considerations

The unit was shipped to you without the power module installed. Remove the power module prior to shipping.

Each power module contains two “C” size primary lithium batteries. Primary lithium batteries are regulated in transportation by the U.S. Department of Transportation, and are also covered by International Air Transport Association (IATA), International Civil Aviation Organization (ICAO), and European Ground Transportation of Dangerous Goods (ARD). It is the responsibility of the shipper to ensure compliance with these or any other local requirements. Consult current regulations and requirements before shipping.

5.5 Modbus®, EtherNet/IP and OPC mapping

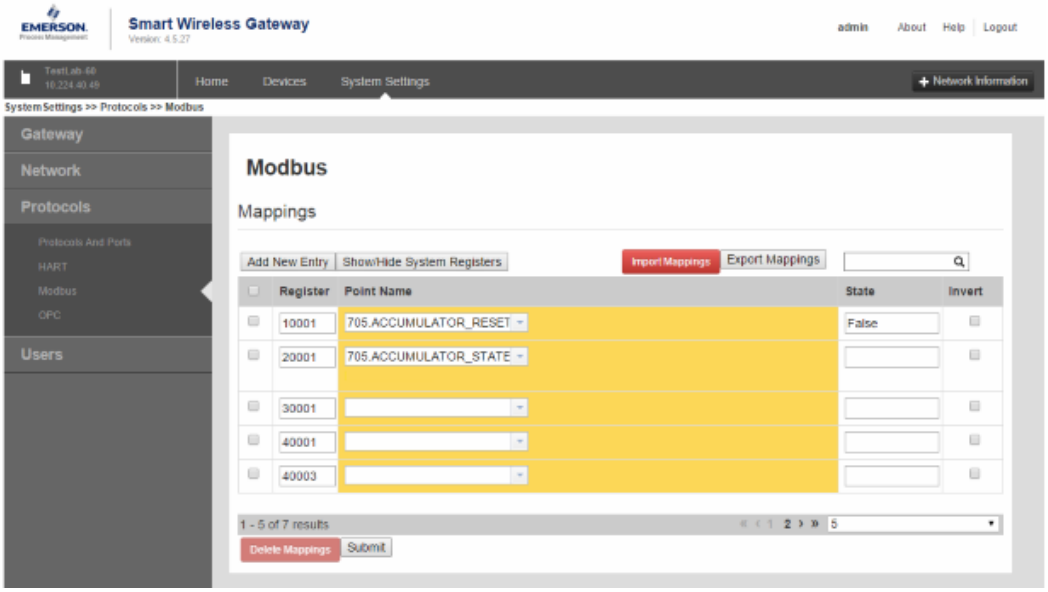
Following is a table of parameters that can be used for Modbus, EtherNet/IP and OPC mapping. These parameters are used by the Smart Wireless Gateway and can be found in the web interface of the Gateway. Some of these parameters are analog values and some are discrete, and this is noted in the description. The Setpoint parameters are used to drive the output channel and for the readback of the state of the output channel.

Parameters for Modbus, EtherNet/IP, and OPC Mapping		
Parameter name	**Description**	**Read/Write**
SUPPLY_VOLTAGE	Maps the supply voltage of the device. For monitoring the health of your power module use SUPPLY_VOLTAGE_HEALTHY	Read
ELECTRONICS_TEMPERATURE	Maps the electronics temperature	Read
TOTALIZED_VOLUME	Maps the totalized volume that the device has measured	Read
AVERAGE_FLOW_RATE	Maps the instantaneous flow rate over that period of time set by the DD	Read
ACCUMULATOR_RESET	Use this parameter to reset the number of total counts on the device	Write
ACCUMULATOR_STATE	What is the current totalized value of the device	Read

Mapping the Rosemount 705 parameters

Below is the Gateway screen where the accumulator reset, accumulator state, totalized_ volume, average_flow variables and parameter can be mapped. This is important to understand how to reset the totalized volume of the device via Modbus, OPC, or EtherNet/IP™.

Figure 5-1. Smart Wireless Gateway Modbus Register Map



To reset the total of the 705 via Modbus, follow the steps below.

1. Navigate to *Modbus* connection.
2. Map **705.Accumulaor_Reset**.
3. **Submit**.

To reset the total of the 705 via OPC, follow the steps below.

1. Navigate to *OPC* connection.
2. Map **705.Accumulaor_Reset**.
3. **Submit**.

To reset the total of the 705 via EtherNet/IP, follow the steps below.

1. Navigate to *EtherNet/IP* connection.
2. Map **705.Accumulaor_Reset**.
3. **Submit**.

5.6 Reset/Restore device

The 705 Totalizer can be reset remotely over the wireless network, or locally via the wired maintenance port. Resetting the device will cause the device to temporarily drop offline and rejoin to the configured wireless network. When resetting the device, you can choose to reset the device with the same configuration as it already has, or to revert the configuration settings to the original values that were present when the device left the manufacturer. When reverting the configuration settings to original values, not that the turbine meter K-factor will also be reverted, so the turbine meter should be verified to ensure the correct K-factor is being used.

Fast keys
3, 5, 2

5.7 How to suspend (pause) the totalization in the device - even though there is still active flow in the process

The 705 allows the totalization to be stopped, which will hold the current totalized volume value and ignore any new input pulses. This can be done through a host connection to the wireless gateway.

5.8 Average Flow rate filtering period

The average flow rate filtering period controls how heavily the average flow rate is filtered. The default setting of 1 second will cause the 705 totalizer to report the average flow rate over a time interval of 1 second. Setting the period to a larger value will reduce noisy flow rate measurements, but will increase the time constant of the reported value.

Fast keys
2, 2, 2, 2, 3

5.9 Low-Flow cut-off

The low flow cutoff value can be configured to cause the 705 totalizer to report zero flow for any rates below the configured threshold. Totalized volume will be unaffected by the low flow cutoff setting. The 705 will continue to totalize any detectable volume - even for very small flow rates.

Fast keys
2, 2, 2, 2, 2

5.10 Input sensitivity

The input sensitivity setting is used to adjust the minimum input voltage required for the 705 Totalizer to count pulses. There are two settings “Normal” and “Reduced”. Under most circumstances, the “Normal” setting will provide the most accurate flow readings. The “Reduced” setting should be used in environments where outside interference is causing a degradation of transmitter performance, such as picking up extra counts/showing a flow rate when the turbine meter is not rotating. If the “Reduced” setting is selected, care should be taken to verify the device is properly reporting flow, particularly at low frequencies.

Fast keys
2, 2, 2, 1, 4

5.11 How to reset the totalized volume

The totalized volume can be reset via the wireless network, through the wireless gateway, using a button located behind the electronics/LCD side housing cover, or by connecting to the local wired maintenance port. To avoid any loss of volume accumulation, the totalizer should only be reset when the flow through the attached turbine meter has been stopped.

Fast keys
3, 5, 1, 4

Appendix A Specifications and Reference Data

Specifications . . . . . page 41
Dimensional drawings . . . . . page 44
Ordering information . . . . . page 46

A.1 Specifications

A.1.1 Functional specifications

Wireless output

IEC 62591 (*Wireless*HART®) 2.4 GHz DSSS

Radio frequency power output from antenna

External (WK option) antenna: Maximum of 10 mW (10 dBm) EIRP
Extended Range, External (WM option) antenna: Maximum of 18 mW (12.5 dBm) EIRP
High Gain, Remote (WN option) antenna: Maximum of 40 mW (16 dBm) EIRP

Local display

The optional integral LCD display can display discrete state and diagnostic information. Display updates at each wireless update or constantly when the device has the optional LCD always on option.

Humidity limits

0–99% relative humidity

Wireless update rate

User selectable, 1 sec. to 60 min.

A.1.2 Physical specifications

Electrical connections

Wireless power module

Replaceable, Intrinsically Safe Lithium-Thionyl Chloride power module with PBT polymer enclosure. Ten year life at one minute update rate.(1)

Field Communicator connections

Communication terminals

Terminal tabs are permanently fixed to terminal block

Materials of construction

Enclosure

Housing - Low-copper aluminum, or stainless steel
Paint - Polyurethane
Cover O-ring - Buna-N

Terminal block and power module pack

PBT

Antenna

PBT/PC integrated omni-directional antenna

Conduit entries

$^1/_2$ - 14 NPT

Weight

Low - copper aluminum

705 without LCD display- 4.6 lbs. (2.0 kg)
705 with M5 LCD display- 4.7 lbs (2.1 kg)

Stainless steel

705 without LCD display- 8.0 lbs. (3.6 kg)
705 with M5 LCD display- 8.1 lbs (3.7 kg)

Enclosure ratings (705)

NEMA 4X, and IP66/67

(1) Reference conditions are 70 °F (21 °C), and routing data for three additional network devices.

Note: Continuous exposure to ambient temperature limits (-40 °F or 185 °F) (-40 °C or 85 °C) may reduce specified power module life by less than 20 percent.

Mounting

Transmitters may be attached directly to switch, brackets also permit remote mounting. See "Dimensional drawings" on page 44.

A.1.3 Frequency input specifications

0 to 10 kHz

A.1.4 Performance specifications

Electromagnetic Compatibility (EMC)

All models

Meets all relevant requirements of EN 61326-1:2006

Vibration effect

Wireless output unaffected when tested per the requirements of IEC60770-1 field or pipeline with high vibration level (10-60 Hz 0.21mm displacement peak amplitude/60-2000 Hz 3g).

Wireless output unaffected when tested per the requirements of IEC60770-1 field with general application or pipeline with low vibration level (10-60 Hz 0.15mm displacement peak amplitude/60-500 Hz 2g).

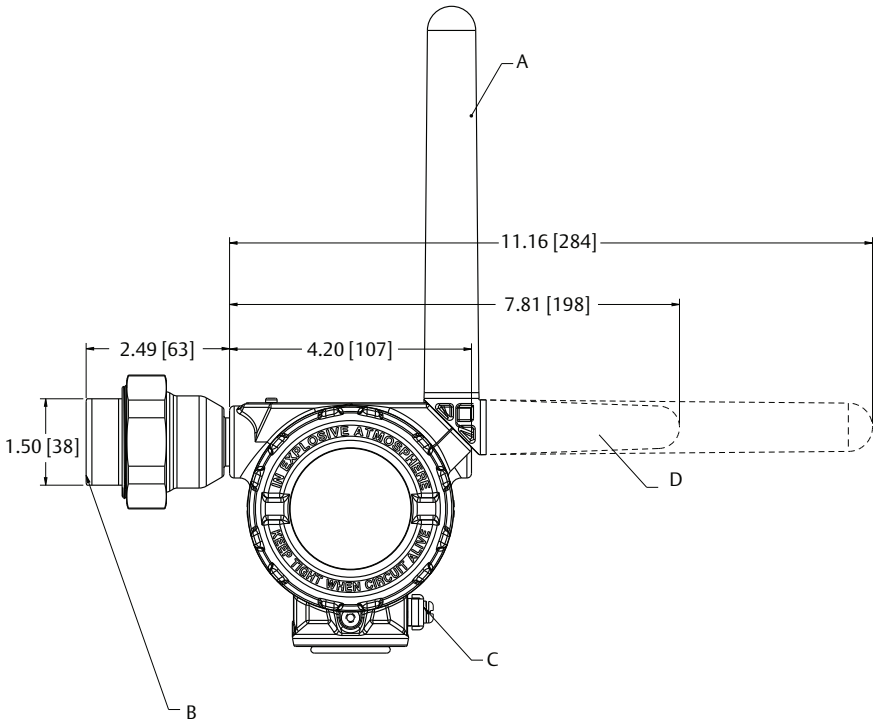
Temperature limits

Description	Operating limit	Storage limit
Without LCD Display	–40 to 185 °F –40 to 85 °C	–40 to 185 °F –40 to 85 °C
With LCD Display	–4 to 175 °F –20 to 80 °C	–40 to 185 °F –40 to 85 °C

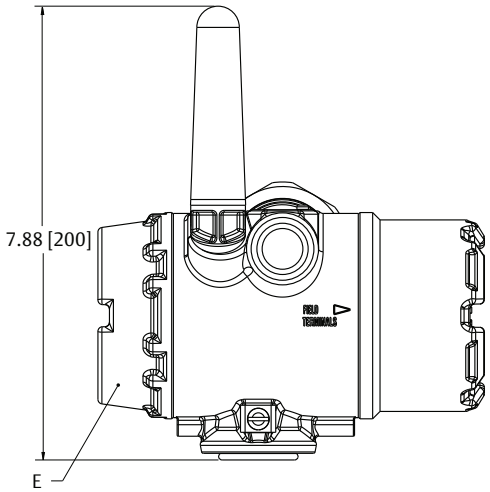
A.2 Dimensional drawings

Figure A-1. Rosemount 705 Transmitter

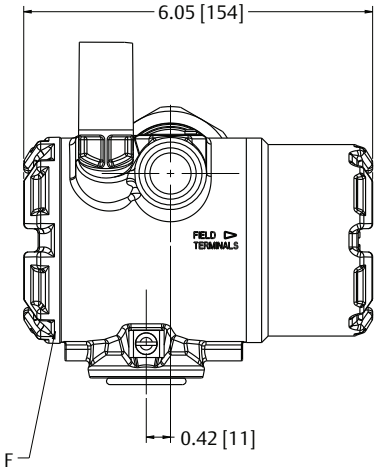
Shown with 2.4 GHz/*Wireless*HART Extended Range Antenna



Shown with Optional Digital Display and 2.4 GHz/*Wireless*HART Antenna



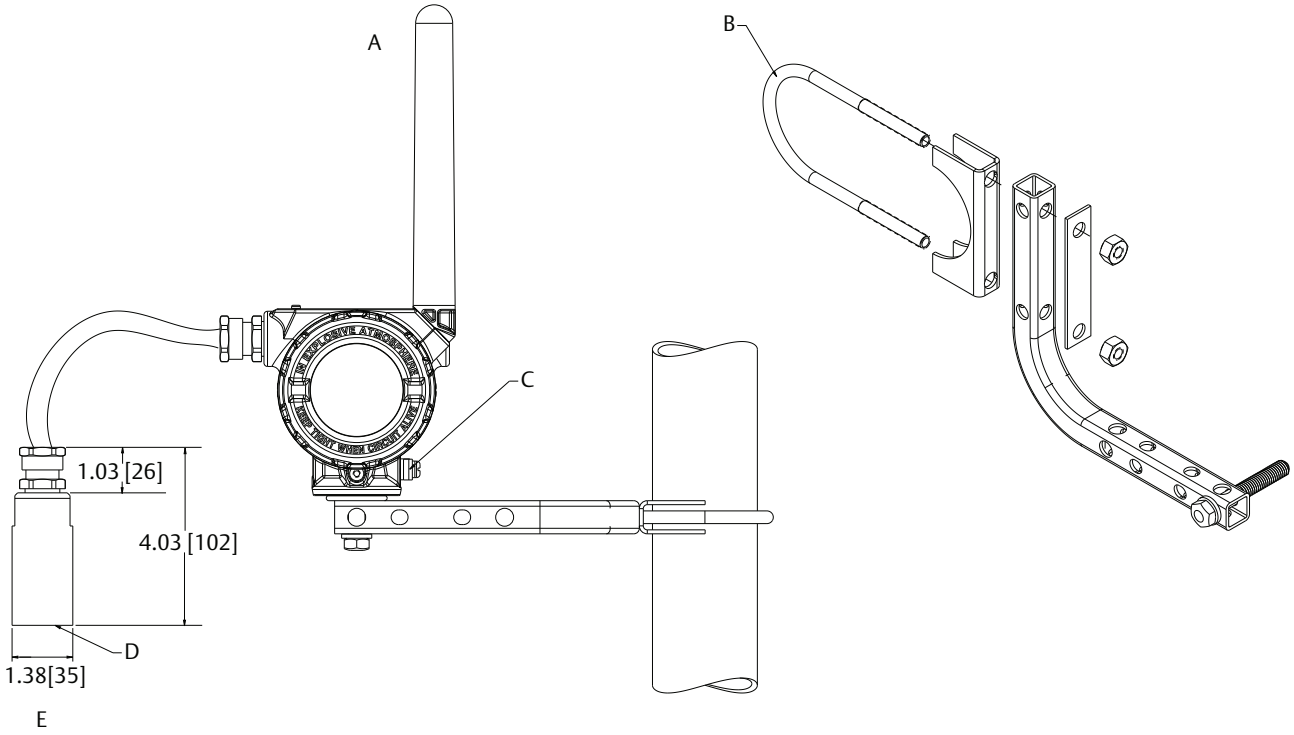
Shown without Optional Digital Display



A. 2.4 GHz/*Wireless*HART extended range antenna
B. 1-in. NPT connection to flow meter
C. Ground screw assembly
D. Possible antenna rotation
E. Digital display cover
F. Transmitter electronics (this side)

Dimensions are in inches (millimeters).

Figure A-2. Rosemount 705 Transmitter Mounting Configurations with Optional Mounting Bracket



A. Pipe Mounting
B. 2-in. U-bolt for pipe mounting
C. Ground screw assembly
D.1-in. NPT connection to flow meter
E. Turbine meter connection

Dimensions are in inches (millimeters).

A.3 Ordering information

Table A-1. Rosemount 705 Wireless Totalizing Transmitter Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery. The Expanded offering is subject to additional delivery lead time.

Product description		
705	Totalizing Transmitter (with connector mil-c-5015)	★
Transmitter output		
X	Wireless	★
Transmitter type		
D1	Direct mount	★
R1	Remote mount (10 ft leads included)	★
Housing		
D	Dual compartment housing - aluminum	★
E	Dual compartment housing - SST	★
Conduit threads		
1	1/2 - 14 NPT	★
Certifications		
NA	No Hazardous Location Approval	
I5	U.S.A Intrinsically Safe	★
I6	Canada Intrinsically Safe	★
N5	U.S.A. Division 2, Non-incendive	★
N6	Canada Division 2, Non-incendive	★
I1	ATEX Intrinsic Safety	★
IU	ATEX Intrinsic Safety for Zone 2	★
I7	IECEx Intrinsic Safety	★
IY	IECEx Intrinsic Safety for Zone 2	★

Wireless options

Wireless update rate, operating frequency and protocol		
WA3	User configurable update rate, 2.4 GHz DSSS, IEC 62591 (*Wireless*HART)	★
Omni directional wireless antenna and SmartPower solutions		
WK1(1)	External antenna, adapter for black power module (I.S. power module sold separately)	★
WM1(1)	Extended range, external antenna, adapter for black power module (I.S. power module sold separately)	★
WJ1(1)	Remote antenna, adapter for black power module (I.S.Power Module sold separately)	
WN1(1)(2)	High-gain, remote antenna, adapter for black power module (I.S. power module sold separately)	

Table A-1. Rosemount 705 Wireless Totalizing Transmitter Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery. The Expanded offering is subject to additional delivery lead time.

Other Options (Include with selected model number)

Display		
M5	LCD display	★
Mounting bracket		
B4	Universal L mounting bracket for 2-inch pipe mounting - SST bracket and bolts	★
Configuration		
C1	Calibration Factor (k-factor) Configuration. Factory configure date, descriptor, message fields, and wireless parameters	★
Typical model number: 705 X D1 D 1 I6 WA3 M5 B4 C1		

(1) Black Power Module must be shipped separately, order model 701PBKKF or part number 00753-9220-0001

(2) Limited availability, consult factory for details.

Spare parts and accessories

Table A-2. Spare Parts and Accessories

Spare parts and accessories	
00705-9000-0001	Cable Assembly, 1 ft long for direct mount option
00705-9000-0002	Cable Assembly, 10 ft long for remote mount option
03151-9270-0003	Remote Housing Bracket Kit
701PBKKF	Black Power Module

Appendix B Product Certifications

Rev 1.0

European Union Directive Information . . . . . page 49
Telecommunication Compliance . . . . . page 49
FCC and IC . . . . . page 49
Ordinary Location Certification from CSA . . . . . page 49
Installing in North America . . . . . page 49

B.1 European Union Directive Information

A copy of the EC Declaration of Conformity can be found at the end of the Quick Start Guide. The most recent revision of the EC Declaration of Conformity can be found at www.rosemount.com.

B.2 Telecommunication Compliance

All wireless devices require certification to ensure that they adhere to regulations regarding the use of the RF spectrum. Nearly every country requires this type of product certification.

Emerson is working with governmental agencies around the world to supply fully compliant products and remove the risk of violating country directives or laws governing wireless device usage.

B.3 FCC and IC

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions: This device may not cause harmful interference. This device must accept any interference received, including interference that may cause undesired operation. This device must be installed to ensure a minimum antenna separation distance of 20 cm from all persons.

B.4 Ordinary Location Certification from CSA

The transmitter has been examined and tested to determine that the design meets the basic electrical, mechanical, and fire protection requirements by CSA, a nationally recognized test laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).

B.5 Installing in North America

The US National Electrical Code (NEC) and the Canadian Electrical Code (CEC) permit the use of Division marked equipment in Zones and Zone marked equipment in Divisions. The markings must be suitable for the area classification, gas, and temperature class. This information is clearly defined in the respective codes.

USA

I5 U.S.A. Intrinsically Safe (IS)
Certificate: CSA 70011131
Standards: FM 3600 – 2011, FM 3610 – 2010, UL Standard 50 – Eleventh Edition, UL 61010-1 – 3rd Edition, ANSI/ISA-60079-0 (12.00.01) – 2013, ANSI/ISA-60079-11 (12.02.01) – 2013, ANSI/IEC 60529 – 2004
Markings: IS CL I, DIV 1, GP A, B, C, D T4; Class 1, Zone 0, AEx ia IIC T4 Ga; T4 (-50 °C ≤ T_a ≤ +70 °C) when installed per Rosemount drawing 00705-1020; Type 4X; IP66;

Totalizer terminal parameters	Turbine meter parameters
V_{OC}/U_O = 2.5 V	V_{MAX}/U_i = 10 V
I_{SC}/I_O = 253 µA	I_{MAX}/I_i = 1 mA
P_{MAX}/P_O = 640 µW	P_{MAX}/P_i = 1 mW
C_i = 2.2 nF	N/A
C_a/C_O = 2.9 µF	N/A
L_i = 4.7 mH	N/A
L_a/L_O= 500 mH	N/A

N5 U.S.A. Division 2, Nonincendive
Certificate: CSA 70011131
Standards: FM 3600 – 2011, FM 3611 – 2004, UL Standard 50 – Eleventh Edition, UL 61010-1 (3rd Edition), ANSI/IEC 60529 – 2004
Markings: NI CL I, DIV 2, GP A, B, C, D T4; T4 (-50 °C ≤ T_a ≤ +70 °C); Type 4X; IP66;

Special Conditions for Safe Use (X):

1. For use only with the Model 701P or Rosemount P/N 753-9220-XXXX Smart Power Battery Module.
2. The surface resistivity of the antenna is greater than 1GΩ. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or a dry cloth.

Canada

I6 Canada Intrinsically Safe (IS)
Certificate: CSA 70011131
Standards: CAN/CSA C22.2 No. 0-10, CAN/CSA C22.2 No. 94-M91, CSA Std C22.2 No.142-M1987, CAN/CSA-60079-0 - 2011, CAN/CSA-60079-11 - 2014, CSA Std C22.2 No. 60529 - 2005, CAN/CSA-C22.2 No. 61010-1 - 2012
Markings: IS CL I, DIV 1, GP A, B, C, D T4; Ex ia IIC T4 Ga, T4; T4 (-50 °C ≤ T_a ≤ +70 °C) when installed per Rosemount drawing 00705-1020; Type 4X; IP66;

Totalizer terminal parameters	Turbine meter parameters
V_{OC}/U_O = 2.5 V	V_{MAX}/U_i = 10 V
I_{SC}/I_O = 253 µA	I_{MAX}/I_i = 1 mA
P_{MAX}/P_O = 640 µW	P_{MAX}/P_i = 1 mW
Ca/C_O = 2.9 µF	N/A
C_i = 2.2 nF	N/A
La/L_O = 500 mH	N/A
L_i = 4.7 mH	N/A

N6 Canada Division 2, Nonincendive
Certificate: CSA 70011131
Standards: CAN/CSA C22.2 No. 0-10, CAN/CSA C22.2 No. 94-M91, CSA Std C22.2 No. 213-M1987 (R2013), CAN/CSA-60079-0 - 2011, CAN/CSA Std C22.2 No. 60529 - 2005, CAN/CSA-C22.2 No. 61010-1 - 2012
Markings: Suitable for Class 1, Division 2, Groups A, B, C, D T4; T4 (-50 °C ≤ T_a ≤ +70 °C); Type 4X; IP66;

Special Conditions for Safe Use (X):

1. For use only with the Model 701P or Rosemount P/N 753-9220-XXXX Smart Power Battery Module.
2. The surface resistivity of the antenna is greater than 1GΩ. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or a dry cloth.

Europe

I1 ATEX Intrinsic Safety
Certificate: Baseefa14ATEX0375X
Standards: EN 60079-0: 2012, EN 60079-11: 2012
Markings: Ⓔx II 1 G Ex ia IIC T4 Ga, T4(-60 °C ≤ T_a ≤ +70 °C)
For use with Rosemount SmartPower™ power module part number 753-9220-0001, or for use with Emerson SmartPower option 701PBKKF.

Totalizer terminal parameters	Turbine meter parameters
U_O = 2.5 V	U_i = 10 V
I_O = 5.6 mA	I_i = 10 mA
P_O = 13.9 mW	P_i = 1 mW
C_i = 2.2 nF	N/A
L_i= 4.7 mH	N/A

Special Conditions for Safe Use (X):

1. The surface resistivity of the antenna is greater than 1GΩ. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or a dry cloth.
2. The 705 enclosure may be made of aluminum alloy and given a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion if located in a Zone 0 area.

IU ATEX Intrinsic Safety for Zone 2
Certificate: Baseefa15ATEX0059X
Standards: EN 60079-0: 2012, EN 60079-11: 2012
Markings: ⟨Ex⟩ II 3 G Ex ic IIC T4 Gc, T4(-60 °C ≤ T_a ≤ +70 °C)
For use with Rosemount SmartPower power module part number 753-9220-0001, or for use with Emerson SmartPower option 701PBKKF.

Totalizer terminal parameters	Turbine meter parameters
U_O = 2.5 V	U_i = 10 V
I_O = 5.6 mA	I_i = 10 mA
P_O = 13.9 mW	P_i = 1 mW
C_i = 2.2 nF	N/A
L_i= 4.7 mH	N/A

Special Conditions for Safe Use (X):

1. The surface resistivity of the antenna is greater than 1GΩ. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or a dry cloth.
2. The 705 enclosure may be made of aluminum alloy and given a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion if located in a Zone 0 area.

International

I7 IECEx Intrinsic Safety
Certificate: IECEx BAS 14.0173X
Standards: IEC 60079-0: 2011, IEC 60079-11: 2011
Markings: Ex ia IIC T4 Ga, T4 (-60 °C ≤ T_a ≤ +70 °C)
For use with Rosemount SmartPower power module part number 753-9220-0001, or for use with Emerson SmartPower option 701PBKKF.

Turbine meter terminal output parameters	Turbine meter terminal input parameters
U_O = 2.5 V	U_i = 10 V
I_O = 5.6 mA	I_i = 10 mA
P_O = 13.9 mW	P_i = 1 mW
C_i = 2.2 nF	N/A
L_i = 4.7 mH	N/A

Special Conditions for Safe Use (X):

1. The surface resistivity of the antenna is greater than 1GΩ. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or a dry cloth.
2. The 705 enclosure may be made of aluminum alloy and given a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion if located in a Zone 0 area.

IY IECEx Intrinsic Safety for Zone 2
Certificate: IECEx BAS 14.0173X
Standards: IEC 60079-0: 2011, IEC 60079-11: 2011
Markings: Ex ic IIC T4 Gc, T4 (-60 °C ≤ T_a ≤ +70 °C)
For use with Rosemount SmartPower power module part number 753-9220-0001, or for use with Emerson SmartPower option 701PBKKF.

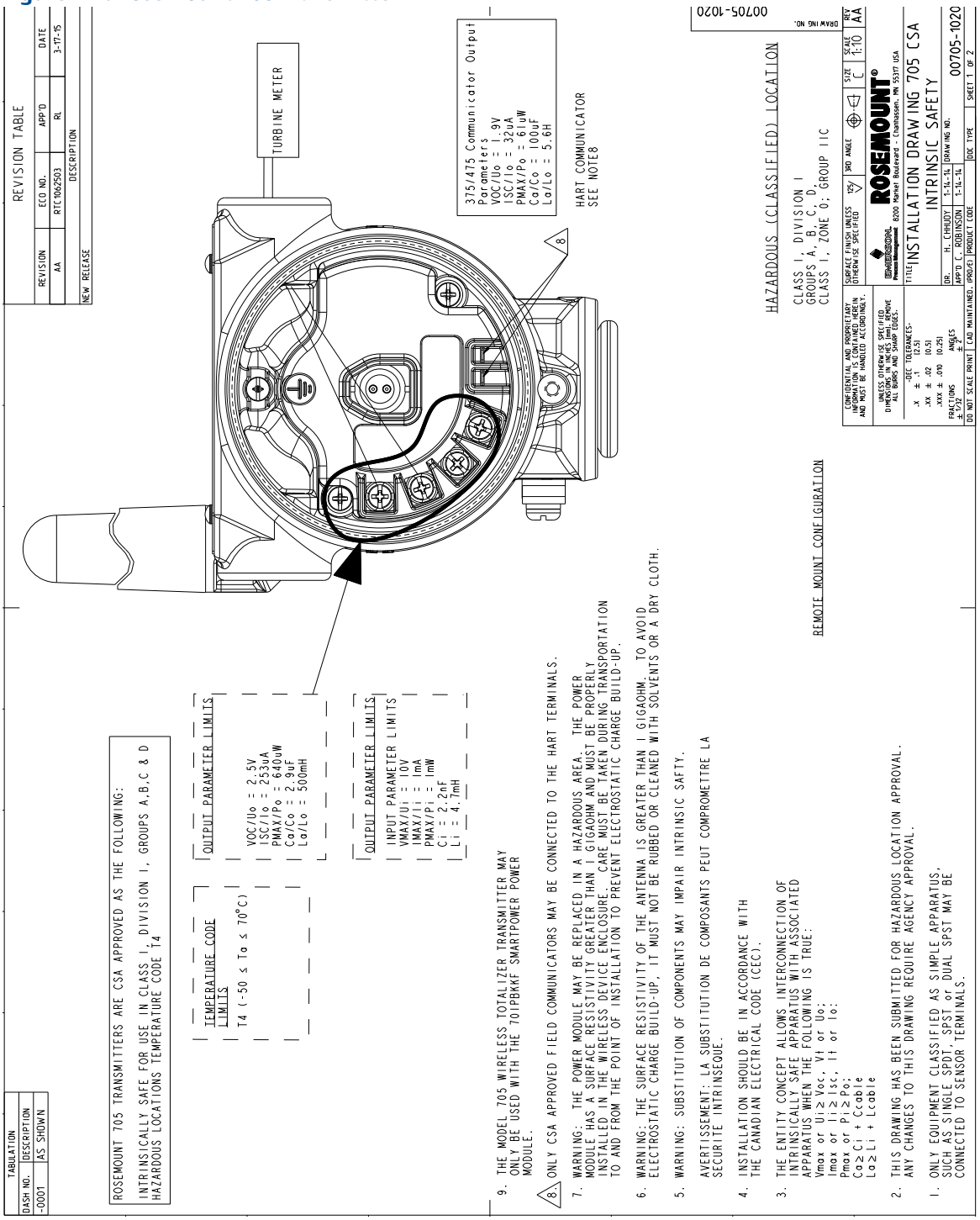
Turbine meter terminal output parameters	Turbine meter terminal input parameters
U_O = 2.5 V	U_i = 10 V
I_O = 5.6 mA	I_i = 10 mA
P_O = 13.9 mW	P_i = 1 mW
C_i = 2.2 nF	N/A
L_i = 4.7 mH	N/A

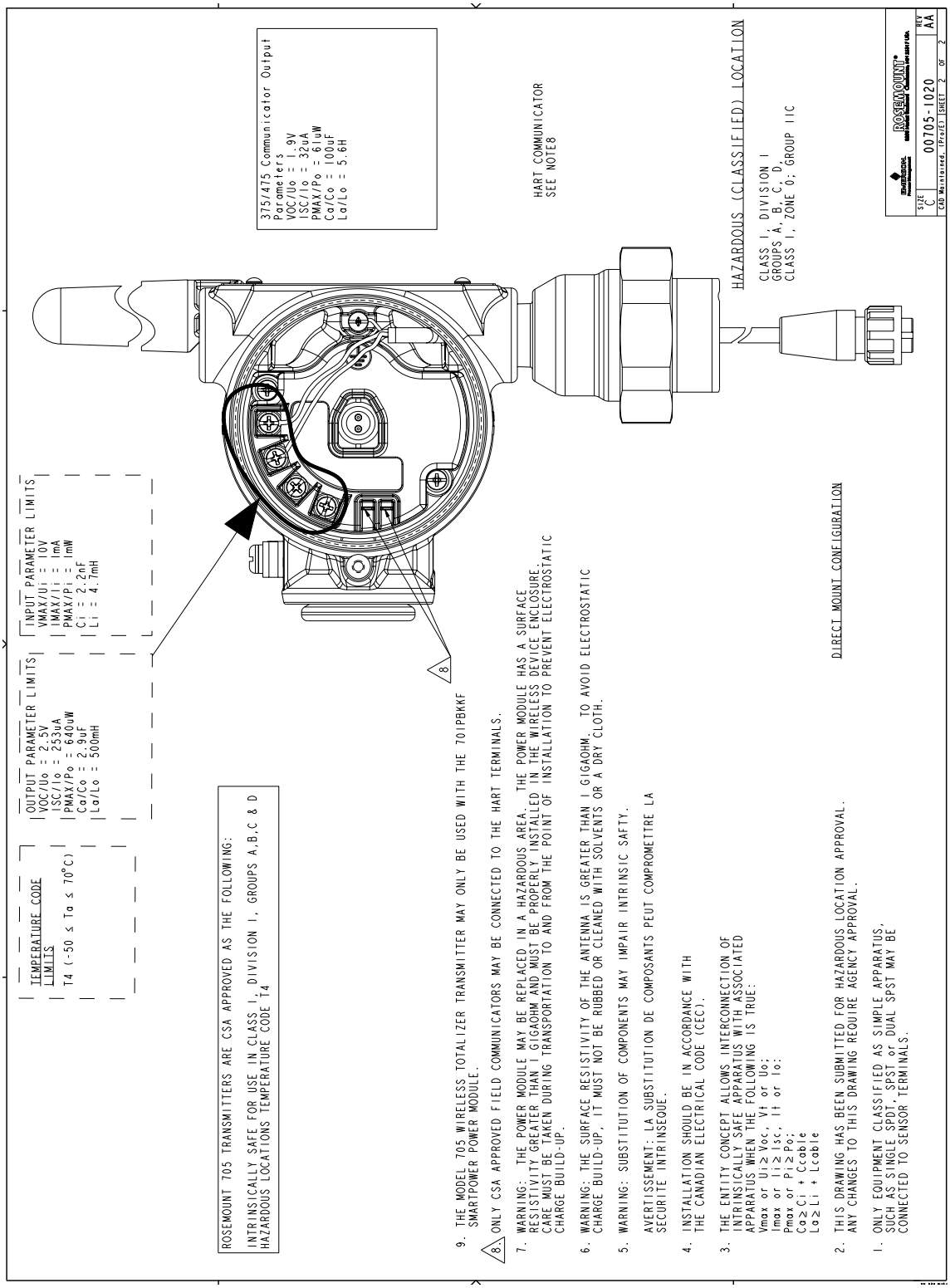
Special Conditions for Safe Use (X):

1. The surface resistivity of the antenna is greater than 1GΩ. To avoid electrostatic charge build-up, it must not be rubbed or cleaned with solvents or a dry cloth.
2. The 705 enclosure may be made of aluminum alloy and given a protective polyurethane paint finish; however, care should be taken to protect it from impact or abrasion if located in a Zone 0 area.

B.6 Installation drawings

Figure B-1. Rosemount 705 Transmitter


REVISION TABLE
REVISION | ECO NO. | APP'D | DATE
AA | RTC062503 | RL | 3-17-15
DESCRIPTION
NEW RELEASE
TABULATION
DASH NO. | DESCRIPTION
-0001 | AS SHOWN
ROSEMOUNT 705 TRANSMITTERS ARE CSA APPROVED AS THE FOLLOWING:
INTRINSICALLY SAFE FOR USE IN CLASS I, DIVISION 1, GROUPS A,B,C & D
HAZARDOUS LOCATIONS TEMPERATURE CODE T4
TEMPERATURE CODE
T4 (-50 ≤ Ta ≤ 70°C)
OUTPUT PARAMETER LIMITS
VOC/Uo = 2.5V
ISC/Io = 253uA
PMAX/Po = 640uW
Ca/Co = 2.9uF
La/Lo = 500mH
OUTPUT PARAMETER LIMITS
INPUT PARAMETER LIMITS
VMAX/Ui = 10V
IMAX/Ii = 1mA
PMAX/Pi = 1mW
Ci = 2.2nF
Li = 4.7mH
TURBINE METER
375/475 Communicator Output
Parameters
VOC/Uo = 1.9V
ISC/Io = 32uA
PMAX/Po = 61uW
Ca/Co = 100uF
La/Lo = 5.6H
HART COMMUNICATOR
SEE NOTE8
8
9. THE MODEL 705 WIRELESS TOTALIZER TRANSMITTER MAY ONLY BE USED WITH THE 701PBKKF SMARTPOWER POWER MODULE.
8. ONLY CSA APPROVED FIELD COMMUNICATORS MAY BE CONNECTED TO THE HART TERMINALS.
7. WARNING: THE POWER MODULE MAY BE REPLACED IN A HAZARDOUS AREA. THE POWER MODULE HAS A SURFACE RESISTIVITY GREATER THAN 1 GIGAOHM AND MUST BE PROPERLY INSTALLED IN THE WIRELESS DEVICE ENCLOSURE. CARE MUST BE TAKEN DURING TRANSPORTATION TO AND FROM THE POINT OF INSTALLATION TO PREVENT ELECTROSTATIC CHARGE BUILD-UP.
6. WARNING: THE SURFACE RESISTIVITY OF THE ANTENNA IS GREATER THAN 1 GIGAOHM. TO AVOID ELECTROSTATIC CHARGE BUILD-UP, IT MUST NOT BE RUBBED OR CLEANED WITH SOLVENTS OR A DRY CLOTH.
5. WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFTY.
AVERTISSEMENT: LA SUBSTITUTION DE COMPOSANTS PEUT COMPROMETTRE LA SECURITE INTRINSEQUE.
4. INSTALLATION SHOULD BE IN ACCORDANCE WITH THE CANADIAN ELECTRICAL CODE (CEC).
3. THE ENTITY CONCEPT ALLOWS INTERCONNECTION OF INTRINSICALLY SAFE APPARATUS WITH ASSOCIATED APPARATUS WHEN THE FOLLOWING IS TRUE:
Vmax or Ui ≥ Voc, Vt or Uo;
Imax or Ii ≥ Isc, It or Io;
Pmax or Pi ≥ Po;
Ca ≥ Ci + Ccable
La ≥ Li + Lcable
2. THIS DRAWING HAS BEEN SUBMITTED FOR HAZARDOUS LOCATION APPROVAL. ANY CHANGES TO THIS DRAWING REQUIRE AGENCY APPROVAL.
1. ONLY EQUIPMENT CLASSIFIED AS SIMPLE APPARATUS, SUCH AS SINGLE SPDT, SPST or DUAL SPST MAY BE CONNECTED TO SENSOR TERMINALS.
REMOTE MOUNT CONFIGURATION
HAZARDOUS (CLASSIFIED) LOCATION
CLASS I, DIVISION I
GROUPS A, B, C, D,
CLASS I, ZONE 0; GROUP IIC
DRAWING NO. 00705-1020
CONFIDENTIAL AND PROPRIETARY INFORMATION IS CONTAINED HEREIN, AND MUST BE HANDLED ACCORDINGLY.
SURFACE FINISH UNLESS OTHERWISE SPECIFIED 125
3RD ANGLE
SIZE C
SCALE 1:10
REV AA
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES REMOVE ALL BURRS AND SHARP EDGES.
DECIMAL TOLERANCES
.X ± .1 [2.5]
.XX ± .02 [0.5]
.XXX ± .010 [0.25]
FRACTIONS ± 1/32
ANGLES ± 1°
ROSEMOUNT
Emerson Process Management
8200 Market Boulevard - Chanhassen, MN 55317 USA
TITLE INSTALLATION DRAWING 705 CSA INTRINSIC SAFETY
DR. H. CHMIDY 1-14-14
APP'D C. ROBINSON 1-14-14
DRAW NO. 00705-1020
DO NOT SCALE PRINT | CAD MAINTAINED | PRODUCT CODE | DOC TYPE | SHEET 1 OF 2


ROSEMOUNT 705 TRANSMITTERS ARE CSA APPROVED AS THE FOLLOWING:
INTRINSICALLY SAFE FOR USE IN CLASS I, DIVISION 1, GROUPS A,B,C & D
HAZARDOUS LOCATIONS TEMPERATURE CODE T4
TEMPERATURE CODE
T4 (-50 ≤ Ta ≤ 70°C)
OUTPUT PARAMETER LIMITS
VOC/Uo = 2.5V
ISC/Io = 253uA
PMAX/Po = 640uW
Ca/Co = 2.9uF
La/Lo = 500mH
INPUT PARAMETER LIMITS
VMAX/Ui = 10V
IMAX/Ii = 1mA
PMAX/Pi = 1mW
Ci = 2.2nF
Li = 4.7mH
375/475 Communicator Output Parameters
VOC/Uo = 1.9V
ISC/Io = 32uA
PMAX/Po = 61uW
Ca/Co = 100uF
La/Lo = 5.6H
HART COMMUNICATOR
SEE NOTE8
HAZARDOUS (CLASSIFIED) LOCATION
CLASS I, DIVISION 1
GROUPS A, B, C, D,
CLASS I, ZONE 0; GROUP IIC
DIRECT MOUNT CONFIGURATION
9. THE MODEL 705 WIRELESS TOTALIZER TRANSMITTER MAY ONLY BE USED WITH THE 701PBKKF SMARTPOWER POWER MODULE.
8. ONLY CSA APPROVED FIELD COMMUNICATORS MAY BE CONNECTED TO THE HART TERMINALS.
7. WARNING: THE POWER MODULE MAY BE REPLACED IN A HAZARDOUS AREA. THE POWER MODULE HAS A SURFACE RESISTIVITY GREATER THAN 1 GIGAOHM AND MUST BE PROPERLY INSTALLED IN THE WIRELESS DEVICE ENCLOSURE. CARE MUST BE TAKEN DURING TRANSPORTATION TO AND FROM THE POINT OF INSTALLATION TO PREVENT ELECTROSTATIC CHARGE BUILD-UP.
6. WARNING: THE SURFACE RESISTIVITY OF THE ANTENNA IS GREATER THAN 1 GIGAOHM. TO AVOID ELECTROSTATIC CHARGE BUILD-UP, IT MUST NOT BE RUBBED OR CLEANED WITH SOLVENTS OR A DRY CLOTH.
5. WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFTY.
AVERTISSEMENT: LA SUBSTITUTION DE COMPOSANTS PEUT COMPROMETTRE LA SECURITE INTRINSEQUE.
4. INSTALLATION SHOULD BE IN ACCORDANCE WITH THE CANADIAN ELECTRICAL CODE (CEC).
3. THE ENTITY CONCEPT ALLOWS INTERCONNECTION OF INTRINSICALLY SAFE APPARATUS WITH ASSOCIATED APPARATUS WHEN THE FOLLOWING IS TRUE:
Vmax or Ui ≥ Voc, Vt or Uo;
Imax or Ii ≥ Isc, It or Io;
Pmax or Pi ≥ Po;
Ca ≥ Ci + Ccable
La ≥ Li + Lcable
2. THIS DRAWING HAS BEEN SUBMITTED FOR HAZARDOUS LOCATION APPROVAL. ANY CHANGES TO THIS DRAWING REQUIRE AGENCY APPROVAL.
1. ONLY EQUIPMENT CLASSIFIED AS SIMPLE APPARATUS, SUCH AS SINGLE SPDT, SPST or DUAL SPST MAY BE CONNECTED TO SENSOR TERMINALS.
ROSEMOUNT
SIZE C
00705-1020
REV AA
SHEET 2 OF 2

Appendix C High Gain Remote Antenna Option

Safety messages . . . . . page 57
Functional specifications . . . . . page 57
Installation considerations . . . . . page 59
Transient/lightning considerations . . . . . page 59
Dimensional drawings . . . . . page 60
Installing the high gain remote antenna . . . . . page 61

C.1 Safety messages

Procedures and instructions in this section may require special precautions to ensure the safety of the personnel performing the operations. Information that raises potential safety issues is indicated by a warning symbol (⚠). Refer to the following safety messages before performing an operation preceded by this symbol.

C.1.1 Warnings

⚠ WARNING

When installing remote mount antennas for the wireless field device, always use established safety procedures to avoid falling or contact with high-power electrical lines.

Install remote antenna components for the wireless field device in compliance with local and national electrical codes and use best practices for lightning protection.

Before installing consult with the local area electrical inspector, electrical officer, and work area supervisor.

The wireless field device remote antenna option is specifically engineered to provide installation flexibility while optimizing wireless performance and local spectrum approvals. To maintain wireless performance and avoid non-compliance with spectrum regulations, do not change the length of cable or the antenna type.

If the supplied remote mount antenna kit is not installed per these instructions, Emerson Process Management is not responsible for wireless performance or non-compliance with spectrum regulations.

Be aware of overhead electrical power lines.

C.2 Functional specifications

C.2.1 Output

*Wireless*HART® 2.4 GHz DSSS (Direct Sequence Spread Spectrum)

Radio Frequency Power Output from Antenna:

- High Gain Remote (WN option) antenna: Maximum of 40 mW (16 dBm) EIRP (Equivalent Isotropically Radiated Power)
- High Gain Remote Antenna (WJ1 option): Maximum of 40 mW (16 dBm) EIRP 25 feet of cable.

C.2.2 Coaxial length

25 feet (7.6 meters) with Type N Connections

C.2.3 Coaxial material

- Heavy duty, low loss LMR400 cable
- Minimum coaxial bend diameter: 1.0 ft (0.3 meter)

C.2.4 Antenna

- Remote mount Omni directional Antenna
- Fiberglass & Aluminum construction
- 8 Db Gain WJ1 - 6dBi
- Meets MIL-STD-810G (Method 510.5, Procedure I and II)

C.2.5 Physical specifications

Weight: 1.0 lb (0.4 kg)

C.2.6 RF lightning arrestor

In-line lightning arrestor

Electrical Connection: Lightning arrestor MUST be grounded per local electrical codes and regulations.

Mounting Bracket

- Horizontal or vertical mast accommodation
- Supported mast diameter: 1.0-2.5 inch (2.5-6.4 cm)
- Aluminum bracket
- Nickel/Zinc plated mounting U-bolts

C.2.7 Ratings

NEMA 4X, and IP66/67

C.2.8 Vibration

3g Max vibration

C.3 Installation considerations

C.3.1 Antenna mounting

Mount antenna vertically (±5°)

C.3.2 Antenna height

Mount antenna 14 feet (4.3 meters) above infrastructure with clear line of sight.

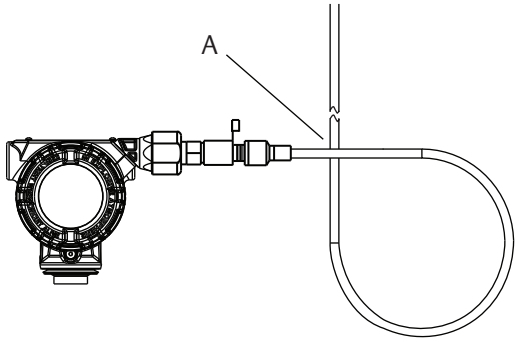
Coaxial Cable

Ensure that coaxial cable is securely affixed to the mast to avoid excessive cable movement.

C.3.3 Installing coaxial drip loop

Ensure a drip loop is installed not closer than 1 foot (0.3 meters) from the transmitter. It may also be convenient to affix the drip loop to the lower portion of the mast ensuring condensation or rainwater will flow away from the coaxial connections.

Figure C-1. Drip Loop Location



A. Coaxial drip loop

C.3.4 Applying coaxial sealant moisture protection

Utilize the coaxial sealant that is included in the high gain remote mounting kit package. Follow included instructions for application on the coaxial connection.

C.4 Transient/lightning considerations

C.4.1 Gateway transient protection

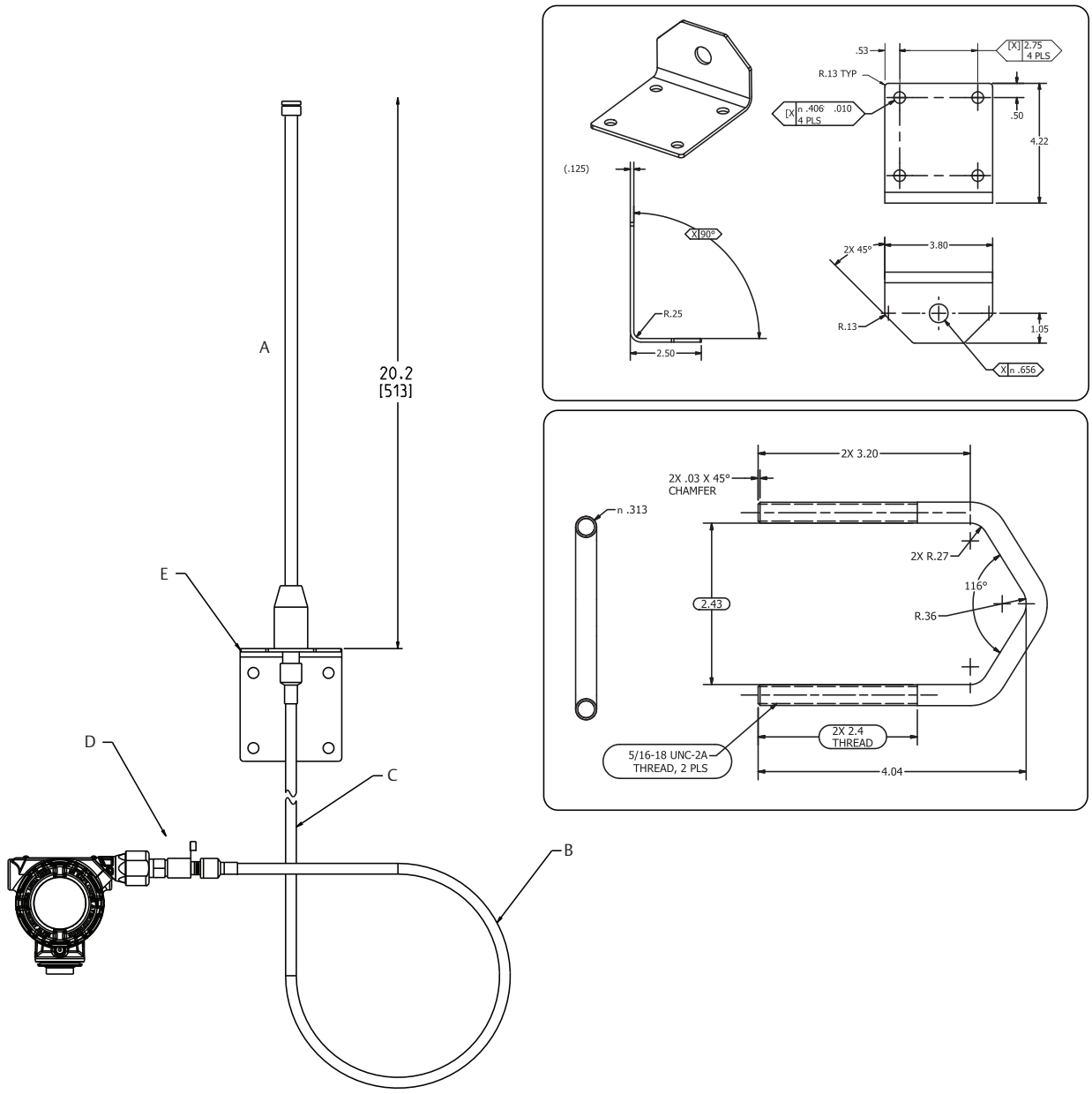
When installing, consider including transient/lightning protection on interface connections (Ethernet, Modbus, and coaxial connections) to other equipment.

C.4.2 RF lightning arrestor ground connection

Ensure grounding connection is made on the RF lightning arrestor ground connection point.

C.5 Dimensional drawings

Figure C-2. Device Connection & RF Lightning Arrestor

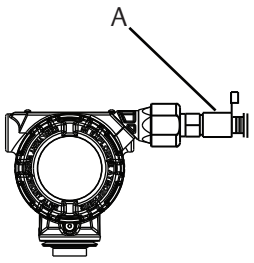


A. Antenna
B. Min drip loop ∅ 12-in. (0.3 m)
C. 25-ft. (7.6 m) Cable
D. Lightning arrestor
E. Mounting bracket

C.6 Installing the high gain remote antenna

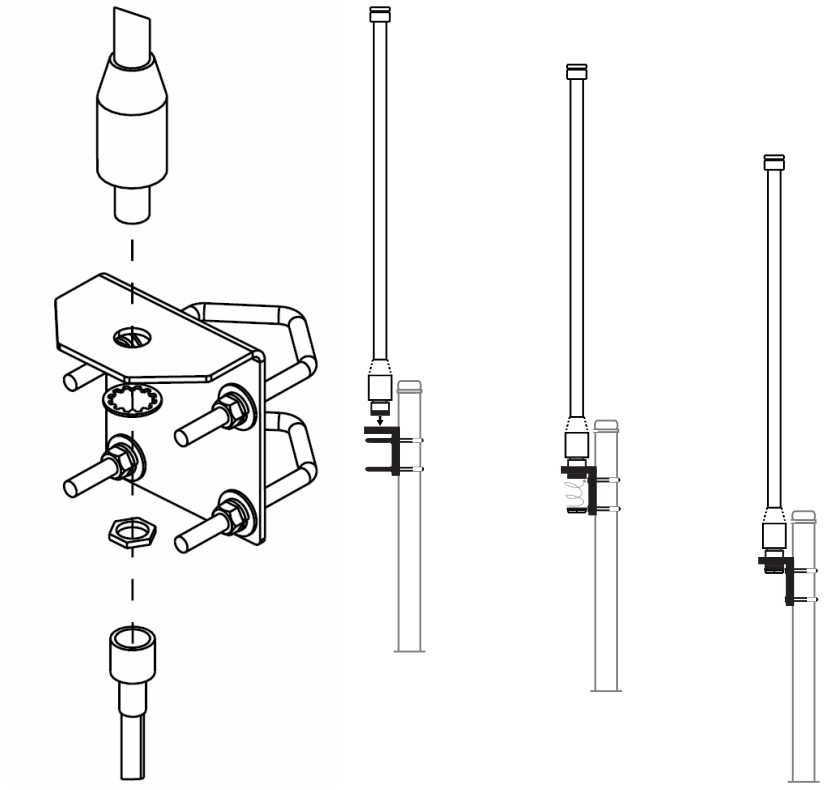
1. Mount the transmitter following best practice mounting procedures as outlined in the Quick Start Guide and Product Manual.

2. Connect the RF Lightning protector to the device and tighten.

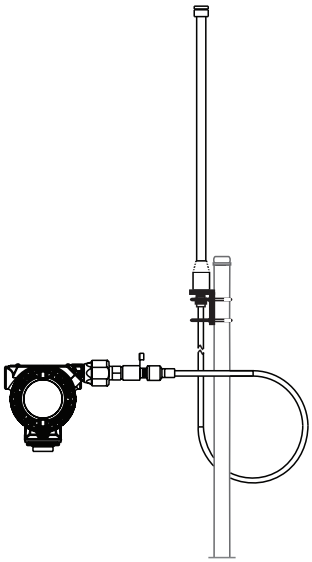


A. RF lightning protector

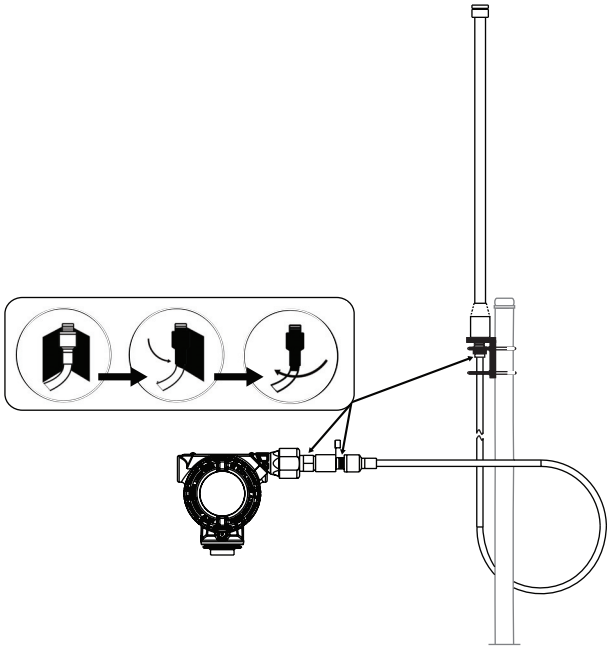
3. Connect antenna to mounting bracket and tighten nut carefully.



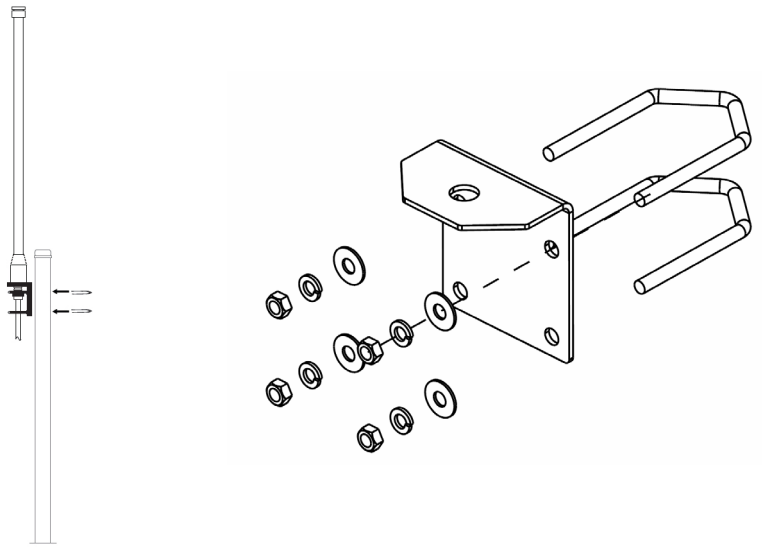
4. Unwind coaxial cable and connect the cable to both the antenna and the lightning protector connected to the transmitter, leaving one loop minimum for a drip loop. Ensure the drip loop is lower than the device, allowing water to flow away from the device.



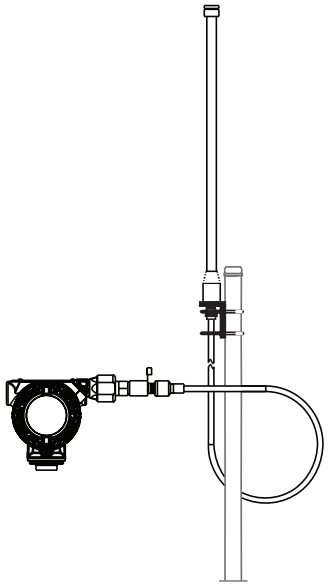
5. Apply the coaxial sealant around each of the coaxial connections and at the lightning arrestor, making sure the RF connections are completely sealed.



6. Attach u-bolts to mounting bracket in correct orientation ensuring antenna will be positioned in a vertical position.



7. Tighten u-bolts to mast and ensure antenna is pointed in a vertical direction.



Appendix D Mapping of alert messages in the HART command 84 additional status

This appendix outlines the most important alerts in the HART command 48 Additional Status Field for the 705 Wireless totalizing transmitter. The information in this section can be used by DeltaV™ for alert monitoring, and in the Rosemount 1420 Smart Wireless Gateway for Additional Status mapping in Modbus, OPC, etc.

A complete list of Additional Status bits is available in the Rosemount 1420 Smart Wireless Gateway.

Table D-1 to Table D-2 displays the device variable and variable mapping indexes for the 705 Wireless totalizing transmitter.

Table D-3 to Table D-5 shows a list of the most important alert messages that may be displayed in the AMS Wireless Configurator and Field Communication together with the location of the Alert in the HART command 48 Additional Status field.

To view Active Alerts, from the Home screen, go to **Service Tools > Active Alerts**.

Table D-1. Device Variable index

Device variable	Index
0	Supply voltage
1	Electronics temperature
2	Totalized volume
3	Average flow rate

Table D-2. Default Variable Mapping Index (can be modified)

Variables	Index
PV	Totalized Volume
SV	Average Flow Rate
TV	Electronics Temperature
QV	Supply Voltage

Table D-3. Failure Alerts (F:)

Message	Additional Status(1)	Description
Electronics Failure	Byte 8 :: Bit 6	A failure has been detected in the device memory and/or electronics
Configuration Error	Byte 2 :: Bit 6	The device has detected a configuration error based on a change to the device
Radio Failure	Byte 1 :: Bit 6	The wireless radio has detected a failure or stopped communicating
Supply Voltage Failure	Byte 6 :: Bit 2	The supply voltage is too low for the device to broadcast

(1) Location of the Alert in the HART command 48 Status field.

Table D-4. Maintenance Alerts (M:)

Message	Additional Status(1)	Description
Totalized Volume Rollover	Byte 3 :: Bit 2	The totalized volume has exceeded the maximum value and automatically reset to zero
Average Flow Rate Saturated	Byte 3 :: Bit 0	The average flow rate is beyond the operating limits of the device and the reported value is saturated
Electronics Temperature Beyond Limits	Byte 8 :: Bit 5	The terminal temperature has exceeded the transmitter's maximum range
Supply Voltage Low	Byte 8 :: Bit 4	The supply voltage is low and may soon affect broadcast updates

(1) Location of the Alert in the HART command 48 Status field.

Table D-5. Advisory Alerts (A:)

Message	Additional Status(1)	Description
Database Memory Warning	Byte 0 :: Bit 2	The device has failed to write to the database memory. Any data written during this time may have been lost
Totalized Volume Warning	Byte 3 :: Bit 1	The totalized volume has exceeded the warning threshold value
Totalized Volume Stopped	Byte 3 :: Bit 5	The totalized volume accumulation has been suspended by user
Sensor Input Life Alert	Byte 3 :: Bit 3	The lifetime pulse count value has exceeded the configured warning threshold
HI HI Volume Alert	Byte 5 :: Bit 4	A process value has surpassed the user defined limit
HI Volume Alert	Byte 5 :: Bit 5	A process value has surpassed the user defined limit
LO Volume Alert	Byte 5 :: Bit 6	A process value has surpassed the user defined limit
LO LO Volume Alert	Byte 5 :: Bit 7	A process value has surpassed the user defined limit
HI HI Flow Alert	Byte 5 :: Bit 0	A process value has surpassed the user defined limit
HI Flow Alert	Byte 5 :: Bit 1	A process value has surpassed the user defined limit
LO Flow Alert	Byte 5 :: Bit 2	A process value has surpassed the user defined limit
LO LO Flow Alert	Byte 5 :: Bit 3	A process value has surpassed the user defined limit
Button Stuck	Byte 1 :: Bit 5	A button on the Electronics Board is detected as stuck in the active position
Non-Critical User Data Warning	Byte 2 :: Bit 1	A user written parameter does not match expected value
Simulation Active	Byte 8 :: Bit 0	The device is in simulation mode and may not be reporting actual information

(1) Location of the Alert in the HART command 48 Status field

Reference Manual
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May 2015

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